TRANSPORTATION PROJECT REPORT

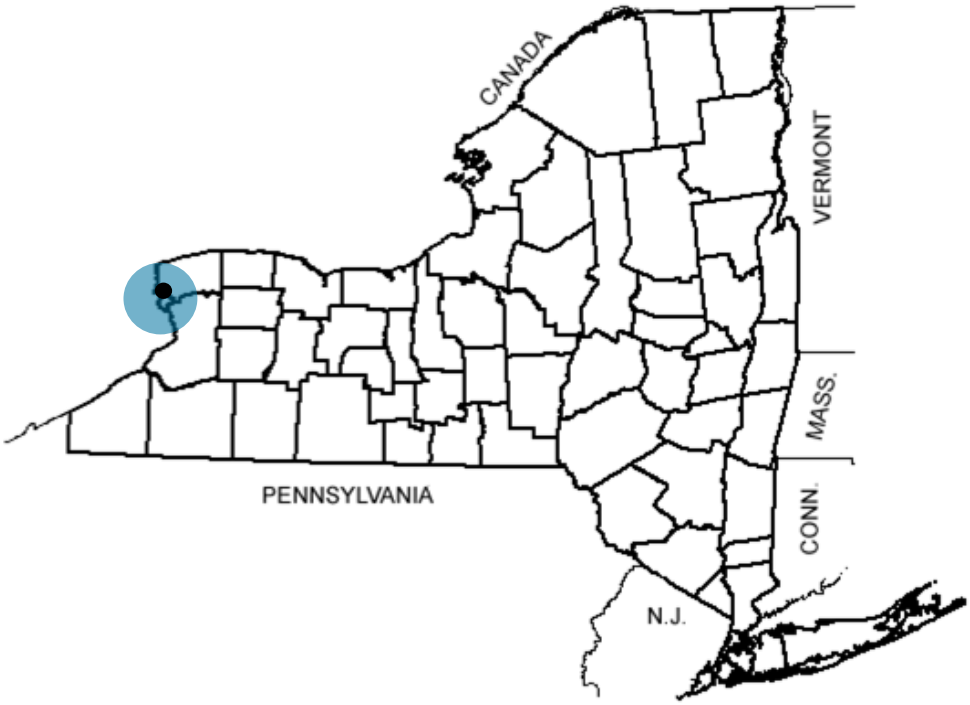
DRAFT DESIGN REPORT / DRAFT ENVIRONMENTAL IMPACT STATEMENT / DRAFT 4(f) EVALUATION

APPENDIX B10

Noise Analysis Report

November 2016

PIN 5470.22
NYS Route 198 (Scajaquada Expressway Corridor)
Grant Street Interchange to Parkside Avenue Intersection
City of Buffalo
Erie County



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Reconstruction of NYS Route 198 (Scajaquada) from the Grant Street Interchange to the Parkside Avenue Intersection

TRAFFIC NOISE ANALYSIS REPORT

CITY OF BUFFALO, ERIE COUNTY, NEW YORK

P.I.N. 5470.22 / October 2016

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1.0 INTRODUCTION

The following Noise Analysis Report has been prepared by Bergmann Associates, P.C. (Bergmann) for the Reconstruction of NYS Route 198, from the Grant Street interchange to the Parkside Avenue intersection within the City of Buffalo, Erie County, New York (PIN 5470.22). This report was prepared for the New York State Department of Transportation (NYSDOT) under contract D015557 in technical support of the proposed roadway reconstruction project. The noise study area is from I-190 to NYS Route 33, and additional outline intersection areas, see **Figure 1** in **Attachment A** for the Project Location Map. Please refer to Sections 1.1 and 1.2 of the Design Report / Environmental Impact Statement for more information regarding the project description, and refer to Section 3.2 of the Design Report / Environmental Impact Statement for more information regarding the project alternatives.

1.1 Scope and Purpose

The purpose of this noise study is to determine potential future traffic noise impacts for the Build Alternative. This report includes a summary of the noise analysis, impact determination, abatement evaluation and conclusions. Procedures for this study conform to the requirements developed by the Federal Highway Administration (FHWA) as presented in Chapter I of Title 23, Code of Federal Regulations, Part 772 (23 CFR 772), Procedures for Abatement of Highway Traffic Noise and Construction Noise, and the New York State Department of Transportation (NYSDOT) Noise Analysis Policy, contained in the NYSDOT Environmental Manual (TEM). The procedures include the following:

A. Review existing activities and assign Activity Categories.

B. Identify noise receivers and perform noise measurements to validate the noise model and determine the existing worst noise hour.

C. Model existing traffic noise levels and future traffic noise levels in the design year for each build alternative.

D. Determine locations where the build alternative(s) would cause a traffic noise impact.

E. Evaluate noise abatement measures for areas where future traffic noise impacts are identified.

F. Recommend abatement measures, if they are feasible and reasonable, for the impacted areas.

G. Coordinate with local officials.

H. Discuss the temporary construction noise expected from the project and the temporary abatement measures that could be implemented to minimize or eliminate adverse construction noise impacts to the community.

23 CFR 772 requires that noise analyses be performed for Type I projects. A Type I project as defined in 23 CFR 772.5 includes the following: the construction of a highway on new location; the physical alteration of an existing highway where there is a substantial horizontal and/or vertical alteration; the addition of a through travel lane; the addition of an auxiliary lane; the addition or relocation of interchange lanes or ramps added to a quadrant to complete an existing partial interchange; restriping existing pavement for the purpose of adding a through-lane or an auxiliary lane; and the addition of a new or substantial alteration of a weight station, rest stop, ride-share lot or toll plaza. This project consists of a substantial horizontal alteration that halves the distance between the traffic noise source and the closest receptor (Delaware Park) between the existing condition to the future build condition. Therefore, this project is considered a Type I project and a noise study is required.

3.0 NOISE CHARACTERISTICS

Three physical characteristics of noise have been identified as being important to the determination of noise acceptance:

- The Intensity,
- The Frequency, and
- The Time-Varying Nature of the Noise.

Intensity is a measure of the magnitude or energy of the sound and is directly related to pressure level. The human ear is capable of sensing a wide range of pressure levels, and consequently, pressure levels are expressed in terms of a logarithmic scale with units called decibels (dB). As the intensity of a noise increases, it is judged to be more annoying or less acceptable.

Frequency is a measure of the total qualities of sound. People are most sensitive to sounds in the middle to high frequencies; therefore, higher frequencies tend to cause more annoyance. This sensitivity led to the use of the A-weighted sound level, which provides a single number measure that weights different frequencies of the frequency spectrum in a manner similar to the sensitivity of the human ear. Thus, the A-weighted sound level in decibels (dBA) provides a simple measure of intensity and frequency that correlates well with human hearing. Common noise levels are shown in **Table 3-1**.

Environmental noise is rarely constant with time. It is necessary to use a method of measure that will account for this time-varying nature of noise. The equivalent sound pressure level (Leq) is defined as the continuous steady sound level that would have the same total A-weighted sound energy as the real fluctuating sound measured over the same period of time. Leq is typically used for highway noise analysis. This unit of measure, therefore, has been chosen for use in this study.

Table 3-1 COMMON NOISE LEVELS

Common Outdoor Noise Levels	Noise Levels (dBA)		Common Indoor Noise Levels
	110	110	Rock Band
Jet Flyover at 1000 ft			
	100	100	
Gas Lawnmower at 3 ft			Inside Subway Train
	90	90	Food Blender at 3 ft
Diesel Truck at 50 ft			Garbage Disposal at 3 ft
Noisy Urban (daytime)	80	80	Shouting at 3 ft
Gas Lawnmower at 100 ft	70	70	Vacuum Cleaner at 3 ft
			Normal Speech at 3 ft
Heavy Traffic at 300 ft	60	60	
			Large Business Office
Quiet Urban (daytime)	50	50	Dishwasher Next Room
Quiet Urban (nighttime)	40	40	
Quiet Suburban (nighttime)			Small Theater (background) Library
	30	30	
			Bedroom at Night Concert Hall (background)
Quiet Rural (nighttime)	20	20	
			Broadcast and Recording Studio
	10	10	
			Threshold of Hearing
	0	0	

Source: NYSDOT Document - Field Measurement of Existing Noise Levels: May 1986.

4.0 METHODOLOGY OVERVIEW

The methods used in this analysis are in accordance with the provisions and procedures of the policies stated in the federal noise regulations (23 CFR 772), and the NYSDOT Noise Analysis Policy. The following procedure was used for this study.

1. Existing developed land uses were determined for the project area, and Activity Categories corresponding to each land use were assigned in accordance with 23 CFR 772.

2. Appropriate noise measurement receiver sites were chosen for analysis in the project study area. Using a sound meter that meets ANSI Standards for Type 2 meters, existing noise levels were measured in accordance with the NYSDOT's manual, Field Measurement of Existing Noise Levels. Two measurements were taken at each site. The field noise measurements at each receiver consisted of one field measurement during a peak hour and one field measurement during an off peak hour. Vehicle classification studies performed for the corridor in 2008 and 2016 indicate that, in many cases, the heavy vehicle classification percentages are more than twice as high during the AM peak hour as the PM peak hour. Therefore, since heavy vehicles are substantially louder than automobiles, the peak hours that were measured ranged from 7-9:00 am during the weekdays. Traffic volumes, speeds, vehicle classifications, weather conditions, area topography and particular incidents that may affect the measurement were recorded at each site concurrent with the noise measurements.

3. Using the collected data, computer models reflecting the field conditions were then created for the measurements taken at each site during the worst noise hour with respect to either vehicle counts, classifications, or noise levels (if substantial variations were identified). The FHWA Traffic Noise Model 2.5 (TNM) computer program was used for this modeling. The TNM noise levels predicted by the models were then compared to the measured noise levels in the field to validate the models and their ability to predict noise levels at each site. TNM inputs for each receiver site included the field-measured traffic volumes, vehicle distributions, speeds, and roadway geometrics. Field measured traffic volumes and speeds were entered into the modeled streets that were identified as audible from the chosen receiver locations. In accordance with NYSDOT Noise Policy, the TNM-modeled noise levels are considered accurate if they are within plus or minus 3 dBA of the field measured noise levels (ref. FHWA TNM Users Manual). The results of these model validations are described in Section 6.0.

4. The validated model (described in Step 3) was then used to predict existing traffic noise levels and design year (2040) traffic noise levels produced by the Build Alternative. Future traffic volumes and speeds were entered into the modeled streets that were identified as audible from the chosen receiver locations.

5. The noise levels predicted using the design year (2040) traffic and speeds were compared to the FHWA Noise Abatement Criteria (NAC). Receivers at which predicted noise levels approach (within 1 dBA) or exceed the NAC level of 67 dBA were identified as impacted, requiring the evaluation of noise abatement measures. In accordance with the NYSDOT Noise Policy, the predicted future noise levels were also compared to the existing noise levels to determine the net increase in noise levels. Receivers at which the predicted future traffic noise levels exceed the existing levels by 6 dBA or more are also considered impacted, requiring the evaluation of noise abatement measures.

6. For the areas meeting the criteria described in Number 5 above, noise abatement measures were considered. Abatement measures are recommended for impacted sites when measures are found to be both feasible and reasonable.

5.0 RECEIVER SITES

Activity Categories were assigned to the areas located within the study area. A review of local planning documents for the City of Buffalo was performed as part of the existing conditions analysis for the EIS. This existing conditions analysis, in conjunction with a site visit, was used to identify existing activities and developed lands, and to locate undeveloped lands for which development is permitted. If present, residences, schools, and places of worship were also identified. In determining noise impacts, primary consideration is given to exterior areas.

A total of 20 noise-sensitive receiver areas as defined by 23 CFR 772 were identified and approximate locations for each are shown on **Figure 2** in **Attachment A**. Twelve (12) receiver locations were selected for the project corridor. In addition, eight receivers were selected at locations outside of the project corridor along NYS Route 198, and at outlying areas along local roadways that are predicted to see an increase in traffic volume from existing conditions to the design year. A description of each receiver location and its noise category as defined by 23 CFR 772 follows:

- **Receiver Location A** -- Representative of Buffalo State College with dorms and active sports fields. Receiver located in the athletics area with exterior areas of frequent human use - Activity Categories B and C (school, residential, and active sports area).

- **Receiver Location B** -- Representative of the western portion of the linear park with walking/bike trails, playgrounds, residential areas, a church, and a school. Receiver is located in a representative green space within the linear park. - Activity Categories B and C (residential, church, school, park, playground, active sports area, and recreation area).

- **Receiver Location C** -- Representative of McKinley High School and eastern portion of the linear park with walking/bike trails and playgrounds. Receiver is located in a representative green space within the linear park. - Activity Category C (school, park, and recreation area).

- **Receiver Location D** -- Representative of Buffalo State College Campus House, nearby library, and academic areas. Receiver located in a grassy area representative of exterior use areas - Activity Category C (school and library).

- **Receiver Location E** -- Representative of a portion of the park with walking/bike trails, oriental garden, and the Buffalo and Erie County Historical Society (BECHS) green space. Receiver is located in a representative green space behind the BECHS. - Activity Category C (library, park, picnic area, and recreation area).

- **Receiver Location F** -- Representative of Albright-Knox Art Gallery, Rose Garden/park with walking/bike trails/playgrounds, and Marcy Casino with

associated recreation, green space, and picnic areas. Outdoor special events are often held here. Receiver is located in a representative green space adjacent to the art gallery. - Activity Category C (picnic area and recreation area).

- **Receiver Location G** -- Representative of park with walking/bike trails and western Hoyt Lake with associated recreation and green space. Receiver is located in a representative green space along the walking/bike trail. - Activity Category C (park, picnic area, playgrounds, and recreation area).

- **Receiver Location H** -- Representative of a portion of Delaware Park with walking/bike trails and tennis courts with residential across Nottingham Terrace. Receiver is located in a representative green space within the park. - Activity Categories B and C (residential, park, active sports area, and recreation area).

- **Receiver Location I** -- Representative of park with walking/bike trails and eastern Hoyt Lake with associated recreation and green space. Receiver is located in a representative green space along the walking/bike trail. - Activity Category C (park and recreation area).

- **Receiver Location J** -- Representative of a portion of Delaware Park with walking/bike trails, soccer, golf and tennis courts. Receiver is located in a representative green space within the park. - Activity Category C (park, picnic area, active sports area, and recreation area).

- **Receiver Location K** -- Representative of a portion of Forest Lawn Cemetery with walking/bike trails. Receiver is located in a representative green space within the cemetery. - Activity Category C (cemetery and recreation area).

- **Receiver Location L** -- Representative of approximately 27 residential structures with frontage on the south side of NYS Route 198 west of Main Street, Buffalo Municipal Housing Authority (BMHA) housing, college dormitories, Canisius College, and Medaille College. Receiver is located at a representative property in the front yard. - Activity Categories B and C (residential, and school).

- **Receiver Location M** -- Representative of approximately 18 residential structures with frontage on the north side of NYS Route 198 west of Main Street. Receiver is located at a representative property in the front yard. Within the Location M area is the Sisters of Charity Hospital Office Medical Facility, in which there are no exterior areas of frequent human use - Activity Categories B (residential area) and D (medical facilities with no outdoor areas of frequent human use)

- **Receiver Location N** -- Representative of approximately 25 residential structures with frontage on the south side of NYS Route 198. Receiver is located at a representative property in the front yard. - Activity Category B (residential area).

➢ **Receiver Location O** -- Representative of approximately 30 residential structures with frontage on the north side of NYS Route 198. Receiver is located at a representative property in the front yard. - Activity Category B (residential area).

➢ **Outlying Receiver Locations P1 - P5** – The following five receivers are located at areas near roadways that are predicted to have an increase in traffic volume from existing conditions to the design year. Physical changes to the roadways are not expected in these outlying areas; however, physical changes to NYS Route 198 are expected to influence the volumes along these outlying roadways.

- **Receiver Location P1** -- Representative of residential homes in the area of the Austin Street, Military Road, and the Grant Street Intersection - Activity Category B (residential area).
- **Receiver Location P2** -- Representative of Nichols School on Amherst Street between Nottingham Terrace and Colvin Avenue - Activity Category C (school and active sports area).
- **Receiver Location P3** -- Representative of residential homes on Middlesex Road between Elmwood Avenue and Lincoln Parkway - Activity Category B (residential area).
- **Receiver Location P4** -- Representative of residential homes on Middlesex Rd. between Lincoln Parkway and Delaware Avenue - Activity Category B (residential area).
- **Receiver Location P5** -- Representative of residential homes on Forest Ave. between Lincoln Parkway and Elmwood Avenue - Activity Category B (residential area).

The figures in **Attachment A** and the Field Noise Monitoring Logs in **Attachment B** show the location of the sites evaluated within the study area.

The FHWA NAC are listed in **Table 5-1**. These criteria indicate the noise levels for each activity category at which noise impacts occur and consideration of abatement measures is required.

TABLE 5-1 NOISE ABATEMENT CRITERIA (NAC)
HOURLY A-WEIGHTED SOUND LEVEL - DECIBELS (dBA)

Activity Category	Leq (h) (dBA)	Description of Land Use Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[1]	67 (Exterior)	Residential.
C[1]	67 (Exterior)	Active sport areas, amphitheatres, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 (Interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E[1]	72 (Exterior)	Hotels, motels, offices, restaurants/bars and other developed lands, properties or activities not included in A-D or F.
F	---	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	---	Undeveloped lands that are not permitted.

Leq (h): Equivalent sound pressure level, see Section 3.0 for discussion.
[1]Includes undeveloped lands permitted for this Activity Category.

6.0 MODEL VALIDATION

The NYSDOT Noise Policy requires validation of the TNM noise model for each receiver site by using field measurements of noise, traffic volumes, speeds, and vehicle types. The site-specific volumes, vehicle types, speeds, and geometry are entered into the TNM model to determine the model-predicted noise level, for comparison to the field-measured noise levels. In accordance with FHWA noise regulations and NYSDOT Noise Policy, if the TNM-modeled noise levels are within plus or minus 3 dBA of the field measured noise levels, the model is considered valid.

6.1 Field Measurements

For noise model validation purposes, existing noise measurements were conducted in December 2011 and February/March 2012 at the 20 receiver sites. The receiver locations are shown on **Figure 2** in **Attachment A** and on the Field Noise Monitoring Logs in **Attachment B**.

The weather was clear with temperatures ranging from 20 to 42 degrees F. Wind was less than 16 kph (10 mph) and humidity was between 57 and 89 percent.

Noise levels at each receiver were measured using a Casella CEL-633C Noise Analyzer. To accurately measure the noise level representative of each site, two measurements of at least 15-25 minutes were taken at each site. The field noise measurements at each receiver consisted of one field measurement during the weekday AM peak hours (7-9:00 am) and one field measurement during an off peak hour. Noise levels recorded by the noise analyzer included the equivalent noise level (Leq). The field noise monitoring logs can be found in **Attachment B**. The 2011/2012 field-measured noise levels are shown on **Table 6-1**.

6.2 TNM Model Validation

A TNM noise model (reflecting site-specific conditions, geometry, traffic volumes, vehicle distributions, and speeds recorded during the field noise measurements) was developed for each site. The TNM predicted noise levels were then compared to the field-measured noise levels described in Section 6.1. At all sites, the TNM model validation outputs agreed with the field measured noise levels (i.e., were within plus or minus 3 dBA). This indicates that the TNM model is valid and may be used for the prediction of existing and future noise levels.

The field noise levels and TNM-predicted noise levels for the model validations are shown on **Table 6-1**.

Table 6-1 Field and Model Validation Noise Levels (Leq)

Measurement Site	Major Source(s) of Noise	Start Time	Date	**Field Measured 2011/12** (dBA)**	TNM Predicted* (dBA)
Receiver A: Buffalo State College near athletics area & dorms. - Activity Categories B and C (school, residential, & active sports area).	Route 198 & Iroquois Drive	7:49 AM 9:43 AM	2/8/2012 2/8/2012	**61** **58**	60 ----
Receiver B: Multiple receiver area within western area of linear park. - Activity Categories B and C (residential, church, school, park, playground, active sports area, & recreation area).	Route 198	7:54 AM 10:07 AM	12/1/2011 12/1/2011	**67** **63**	64 ----
Receiver C: McKinley High School & eastern linear park. - Activity Category C (school, park, & recreation area).	Route 198	8:36 AM 9:38 AM	12/1/2011 12/1/2011	**62** **61**	61 ----
Receiver D: BSC Campus House, library, & academic areas. - Activity Category C (school & library).	Route 198 & Iroquois Drive	8:27 AM 9:06 AM	2/8/2012 2/8/2012	**65** **65**	63 ----
Receiver E: BECHS green space, park, & oriental garden. - Activity Category C (library, park, picnic area, & recreation area).	Route 198	8:11 AM 10:19 AM	12/8/2011 12/7/2011	**63** **61**	63 ----
Receiver F: Albright-Knox Art Gallery, Rose Garden/Park, & Marcy Casino. - Activity Category C (picnic area & recreation area).	Route 198, Lincoln Pkwy., & Iroquois Dr.	8:36 AM 3:15 PM	12/8/2011 12/7/2011	**62** **64**	62 ----
Receiver G: Delaware Park & western Hoyt Lake. - Activity Category C (park, picnic area, playgrounds, & recreation area).	Route 198	7:13 AM 1:15 PM	2/3/2012 12/1/2011	**72** **67**	70 ----
Receiver H: Delaware Park trails & athletic areas/Nottingham Terrace residential. - Activity Categories B and C (residential, park, active sports area, & recreation area).	Route 198	7:23 AM 1:56 PM	12/2/2011 12/1/2011	**70** **70**	71 ----
Receiver I: Delaware Park & eastern Hoyt Lake. - Activity Category C (park & recreation area).	Delaware Ave., Route 198, & Ramps	7:50 AM 11:28 AM	2/3/2012 12/1/2011	**61** **61**	60 ----
Receiver J: Delaware Park trails & sports areas. - Activity Category C (park, picnic area, active sports area, & recreation area).	Route 198	7:55 AM 11:58 AM	12/2/2011 12/7/2011	**65** **62**	66 ----
Receiver K: Forest Lawn Cemetery walking/bike trails/park-like setting. - Activity Category C (cemetery & recreation area).	Route 198	8:39 AM 11:05 AM	2/3/2012 12/7/2011	**65** **65**	66 ----

Measurement Site	Major Source(s) of Noise	Start Time	Date	**Field Measured 2011/12** (dBA)**	TNM Predicted* (dBA)
Receiver L: Residential structures south of Route 198, BMHA housing, college dormitories, Canisius College, Medaille College - Activity Categories B and C (residential, school, & hospital).	Route 198 & Humboldt	7:43 AM 9:56 AM	2/9/2012 12/8/2011	**70** **67**	69 ----
Receiver M: Residential structures north of Route 198, Hospital - Activity Category B (residential area), Activity Category D (hospital – Interior)	Route 198 & Humboldt	7:18 AM 9:08 AM	3/6/2012 2/9/2012	**68** **67**	67 ----
Receiver N: Residential structures south of Route 198. - Activity Category B (residential area).	Route 198 & Humboldt	8:21 AM 10:48 AM	2/9/2012 12/8/2011	**72** **73**	70 ----
Receiver O: Residential structures north of Route 198. - Activity Category B (residential area).	Route 198 & Humboldt	7:39 AM 9:28 AM	3/2/2012 2/3/2012	**70** **69**	67 ----
Outlying Receiver P1: Residential near Austin Street, Military Road, & the Grant Street Intersection - Activity Category B (residential area).	Military Road & Austin Street	7:58 AM 2:30 PM	3/6/2012 12/7/2011	**68** **65**	65 ----
Outlying Receiver P2: Nichols School sports & academic areas. - Activity Category C (school & active sports area).	Amherst Street	8:30 AM 9:05 AM	3/2/2012 3/2/2012	**58** **57**	60 ----
Outlying Receiver P3: Residential on Middlesex Rd. between Elmwood Avenue & Lincoln Parkway. - Activity Category B (residential area).	Middlesex Road	7:18 AM 4:15 PM	2/2/2012 12/1/2011	**53** **53**	53 ----
Outlying Receiver P4: Residential on Middlesex Rd. between Lincoln Parkway & Delaware Avenue. - Activity Category B (residential area).	Middlesex Road	7:58 AM 3:37 PM	2/2/2012 12/1/2011	**54** **56**	54 ----
Outlying Receiver P5: Residential on Forest Ave. between Lincoln Parkway & Elmwood Avenue. - Activity Category B (residential area).	Forest Avenue & Lincoln Pkwy.	8:45 AM 1:30 PM	2/2/2012 12/7/2011	**57** **57**	59 ----

---- These measurements were not modeled. Measurements were modeled for AM peak hours at each site.

* The model is considered valid if the modeled noise levels are within ±3 dBA of field sound levels (see Section 4.0).

** Examination of field measured noise levels and extraneous noises (e.g., construction equipment, music, loud voices, animals, wind noise) indicated that AM peak hours had the worst case traffic volumes and traffic-related noise throughout the measured intervals.

7.0 PREDICTION OF NOISE LEVELS USING DESIGN TRAFFIC VOLUMES

Once the model is validated, it is used to predict existing and future highway traffic noise levels along the entire project.

7.1 Model Inputs

As stated earlier, the FHWA TNM model accounts for such factors as:

- Traffic Volumes and Classifications;
- Vehicle Operations Speeds;
- Roadway Alignment and Grade; and
- Physical Features.

Each of these factors are discussed below.

7.1.1 Traffic Volumes and Classifications

Traffic volumes and vehicle classifications, recorded during the field noise measurements, were used to validate the model. Validation modeling used the field obtained volumes, which were broken down into the five TNM default vehicle classifications (automobiles, medium trucks, heavy trucks, buses, and motorcycles). 2016 recorded traffic volumes and vehicle classifications were used to develop an existing conditions model for comparison to the predicted noise levels under the Build Alternative. The field-obtained volumes for the 2016 existing conditions model were broken down into three TNM default vehicle classifications (automobiles, medium trucks, and heavy trucks).

Future (2040) peak hour traffic volumes for area roadways were developed for the project. For further information on how the traffic volumes were derived, please refer to Section 3.3.1.6. and Exhibits 3.3.1.6.-2 through 3.3.1.6.-11 in Appendix C of the Design Report / Environmental Impact Statement.

The 2040 peak hour traffic data were then broken down into the vehicle classification percentages obtained during the field noise measurements and incorporated into the TNM peak hour noise models.

7.1.2 Vehicle Operating Speeds

The vehicle operating speeds used for the 2040 models are generally the worst-case free flow speeds obtained from the project's traffic model.

For further information on the traffic modeling, see Section 3.2.3.2 and Exhibits 3.2.3.2.-2 through 3.2.3.2.-8, along with Section 3.2.3.3. and Exhibit 3.2.3.3-1 of the Design Report / Environmental Impact Statement.

7.1.3 Roadway Alignment and Grade

Roadway alignments and grades used in preparing the noise prediction models for the Build and No-Build Alternatives were obtained from the project plans.

7.1.4 Physical Features

Existing and proposed physical features, such as structures, embankment slopes, earth cut sections and earth berms, can act as noise barriers. Physical features were identified during the field measurements for potential inclusion in the noise prediction models, as appropriate.

7.2 Model Results and Impact Assessment

7.2.1 Model Results

Predicted existing and future traffic noise levels for the receivers based on TNM modeling are summarized in **Table 7-1**. Please note that additional receiver points were incorporated into the TNM model at analysis areas G, H, L, M, N, and O since the nearest sensitive receptor within each of these analysis areas had predicted future traffic noise levels above the NAC. Predicted existing and future traffic noise levels based on TNM modeling are summarized in **Table 7-2** through **Table 7-7**.

Table 7-1 Summary of Analysis Areas - Traffic Noise Levels (Leq)

Receiver			Noise Level (Leq)			
			Existing Conditions (dBA)	Design Year (2040)		
Receiver Location	FHWA Category	NAC (dBA)		No-Build Alternative (dBA)	Build Alternative (dBA)	Impact
Receiver A: Buffalo State College near athletics area & dorms. - Activity Categories B and C (school, residential, & active sports area).	B & C	67 (Exterior)	57	57	57	No
Receiver B: Multiple receiver area within western area of linear park. - Activity Categories B and C (residential, church, school, park, playground, active sports area, & recreation area).	B & C	67 (Exterior)	60	60	59	No
Receiver C: McKinley High School & eastern linear park. - Activity Category C (school, park, & recreation area).	C	67 (Exterior)	58	58	58	No
Receiver D: BSC Campus House, library, & academic areas. - Activity Category C (school & library).	C	67 (Exterior)	61	62	61	No
Receiver E: BECHS green space, park, & oriental garden.	C	67 (Exterior)	61	61	60	No

- Activity Category C (library, park, picnic area, & recreation area).						
Receiver F: Albright-Knox Art Gallery, Rose Garden/Park, & Marcy Casino. - Activity Category C (picnic area & recreation area).	C	67 (Exterior)	61	61	61	No
Receiver G: Delaware Park & western Hoyt Lake. - Activity Category C (park, picnic area, playgrounds, & recreation area).	C	67 (Exterior)	66	66	**66**	**Yes**
Receiver H: Delaware Park trails & athletic areas/Nottingham Terrace residential. - Activity Categories B and C (residential, park, active sports area, & recreation area).	B & C	67 (Exterior)	68	68	**68**	**Yes**
Receiver I: Delaware Park & eastern Hoyt Lake. - Activity Category C (park & recreation area).	C	67 (Exterior)	59	60	60	No
Receiver J: Delaware Park trails & sports areas. - Activity Category C (park, picnic area, active sports area, & recreation area).	C	67 (Exterior)	64	64	64	No
Receiver K: Forest Lawn Cemetery walking/bike trails/park-like setting. - Activity Category C (cemetery & recreation area).	C	67 (Exterior)	63	64	63	No
Receiver L: Residential structures south of Route 198, BMHA housing, college dormitories, Canisius College, Medaille College - Activity Category B (residential, school, & hospital).	B	67 (Exterior)	71	71	**71**	**Yes**
Receiver M: Residential structures north of Route 198. - Activity Category B (residential area).	B	67 (Exterior)	67	67	**67**	**Yes**
Receiver N: Residential structures south of Route 198 (see Table 7-5 for NAC Activity Category D). - Activity Category B (residential area).	B	67 (Exterior)	70	70	**70**	**Yes**
Receiver O: Residential structures north of Route 198. - Activity Category B (residential area).	B	67 (Exterior)	67	67	**67**	**Yes**
Outlying Receiver P1: Residential near Austin Street, Military Road, & the Grant Street Intersection - Activity Category B (residential area).	B	67 (Exterior)	65	65	65	No
Outlying Receiver P2: Nichols School sports & academic areas. - Activity Category C (school & active sports area).	C	67 (Exterior)	60	60	60	No
Outlying Receiver P3: Residential on	B	67	51	51	51	No

Middlesex Rd. between Elmwood Avenue & Lincoln Parkway. - Activity Category B (residential area).		(Exterior)				
Outlying Receiver P4: Residential on Middlesex Rd. between Lincoln Parkway & Delaware Avenue. - Activity Category B (residential area).	B	67 (Exterior)	53	54	53	No
Outlying Receiver P5: Residential on Forest Ave. between Lincoln Parkway & Elmwood Avenue. - Activity Category B (residential area).	B	67 (Exterior)	59	59	59	No

NOTES: An impact occurs if the Build Alternative noise level is 6 dB(A) or greater than the existing level OR the noise level approaches or exceeds the NAC, where "approach" is defined as 1 dB(A) below the NAC of 67 dB(A) for Activity Categories B and C.

TABLE 7-2 ANALYSIS AREA G (Delaware Park)
Eastbound Side of NYS Rte. 198 Between Lincoln Ave and Pedestrian Bridge
TRAFFIC NOISE LEVELS (Leq)

Receiver Site	Location	FHWA Activity Category (NAC in dB(A))	Number of Equivalent Dwelling Units	Existing Noise Levels (dB(A))	Predicted 2040 Future Noise Levels (dB(A))		Noise Level Differences (Build - Existing)	Impact(1)
					No-Build	**Build**		
G1	Delaware Park	C (67)	2	66	66	66	0	**YES**

NOTES: (1) - An impact occurs if the Build Alternative noise level is 6 dB(A) or greater than the existing level OR the noise level approaches or exceeds the NAC, where "approach" is defined as 1 dB(A) below the NAC of 67 dB(A) for Activity Categories B and C.

TABLE 7-3 ANALYSIS AREA H (Delaware Park)
Westbound Side of NYS Rte. 198 Between Lincoln Ave and Delaware Ave
TRAFFIC NOISE LEVELS (Leq)

Receiver Site	Location	FHWA Activity Category (NAC in dB(A))	Number of Dwelling Units or Equivalent	Existing Noise Levels (dB(A))	Predicted 2040 Future Noise Levels (dB(A))		Noise Level Differences (Build - Existing)	Impact(1)
					No-Build	**Build**		
H1	Delaware Park	C (67)	4	68	68	68	0	**YES**
H2	Nottingham	B (67)	6	60	60	60	0	**NO**
H3	Nottingham	B (67)	4	61	61	61	0	**NO**
H4	Nottingham	B (67)	1	60	61	60	0	**NO**

NOTES: (1) - An impact occurs if the Build Alternative noise level is 6 dB(A) or greater than the existing level OR the noise level approaches or exceeds the NAC, where "approach" is defined as 1 dB(A) below the NAC of 67 dB(A) for Activity Categories B and C.

TABLE 7-4 ANALYSIS AREA L Eastbound Side of NYS Rte. 198 Between Parkside Avenue and Main Street TRAFFIC NOISE LEVELS (Leq)								
Receiver Site	**Location**	**FHWA Activity Category (NAC in dB(A))**	**Number of Dwelling Units**	**Existing Noise Levels (dB(A))**	**Predicted 2040 Future Noise Levels (dB(A))**		**Noise Level Differences (Build - Existing)**	**Impact(1)**
					No-Build	**Build**		
L1	Humboldt Pkwy 1	B (67)	3	69	69	69	0	**YES**
L2	Humboldt Pkwy 2	B (67)	2	71	71	71	0	**YES**
L3	Humboldt Pkwy 3	B (67)	2	71	71	71	0	**YES**
L4	Humboldt Pkwy 4	B (67)	4	71	71	71	0	**YES**
L5	Humboldt Pkwy 5	B (67)	1	71	71	71	0	**YES**
L6	APT_BLD 2nd Fl.1	B (67)	2	65	65	65	0	**NO**
L7	APT_BLD 2nd Fl.2	B (67)	3	65	66	65	0	**NO**
L8	APT_BLD 2nd Fl.3	B (67)	3	68	68	68	0	**YES**
L9	APT_BLD 2nd Fl.4	B (67)	3	69	69	69	0	**YES**
L10	APT_BLD 3rd Fl.1	B (67)	2	67	67	67	0	**YES**
L11	APT_BLD 3rd Fl.2	B (67)	3	67	68	67	0	**YES**
L12	APT_BLD 3rd Fl.3	B (67)	3	70	70	70	0	**YES**
L13	APT_BLD 3rd Fl.4	B (67)	3	70	71	70	0	**YES**

NOTES: (1) - An impact occurs if the Build Alternative noise level is 6 dB(A) or greater than the existing level OR the noise level approaches or exceeds the NAC, where "approach" is defined as 1 dB(A) below the NAC of 67 dB(A) for Activity Categories B and C.

(2) – Exterior frequent use areas (balcony/deck locations) were identified and placed in the model for Apartment Building 2nd & 3rd floors.

TABLE 7-5 ANALYSIS AREA M Westbound Side of NYS Rte. 198 Between Parkside Avenue and Main Street TRAFFIC NOISE LEVELS (Leq)								
Receiver Site	**Location**	**FHWA Activity Category (NAC in dB(A))**	**Number of Dwelling Units**	**Existing Noise Levels (dB(A))**	**Predicted 2040 Future Noise Levels (dB(A))**		**Noise Level Differences (Build - Existing)**	**Impact(1)**
					No-Build	**Build**		
M1	Humboldt Pkwy	B (67)	1	69	69	69	0	**YES**
M1A	Hospital (Interior)	D (52)	1	37	37	37	0	**NO**
M2	Humboldt Pkwy	B (67)	4	71	71	71	0	**YES**
M3	Humboldt Pkwy	B (67)	3	70	70	70	0	**YES**
M4	Humboldt Pkwy	B (67)	7	69	70	69	0	**YES**
M5	Humboldt Pkwy	B (67)	3	66	67	66	0	**YES**
M6	Humboldt Pkwy	B (67)	2	66	66	66	0	**YES**
M7	Humboldt Pkwy	B (67)	2	66	66	66	0	**YES**
M8	Humboldt Pkwy	B (67)	1	66	67	66	0	**YES**

NOTES: (1) - An impact occurs if the Build Alternative noise level is 6 dB(A) or greater than the existing level OR the noise level approaches or exceeds the NAC, where "approach" is defined as 1 dB(A) below the NAC of 67 dB(A) for Activity Categories B and C.

TABLE 7-6 ANALYSIS AREA N Eastbound Side of NYS Rte. 198 Between Kensington and East Limits TRAFFIC NOISE LEVELS (Leq)								
Receiver Site	Location	FHWA Activity Category (NAC in dB(A))	Number of Dwelling Units	Existing Noise Levels (dB(A))	Predicted 2040 Future Noise Levels (dB(A))		Noise Level Differences (Build - Existing)	Impact[(1)]
					No-Build	Build		
N1	Humboldt Pkwy	B (67)	12	67	67	67	0	**YES**
N2	Humboldt Pkwy	B (67)	4	67	68	68	1	**YES**
N3	Humboldt Pkwy	B (67)	5	68	69	69	1	**YES**
N4	Humboldt Pkwy	B (67)	4	70	71	71	1	**YES**
N5	Humboldt Pkwy	B (67)	5	71	72	72	1	**YES**
N6	Humboldt Pkwy	B (67)	2	72	72	72	0	**YES**
N7	Humboldt Pkwy	B (67)	4	68	68	68	0	**YES**
N8	Humboldt Pkwy	B (67)	3	67	68	68	1	**YES**
N9	Humboldt Pkwy	B (67)	1	69	69	69	0	**YES**
N10	Humboldt Pkwy	B (67)	4	67	67	67	0	**YES**
N11	Humboldt Pkwy	B (67)	4	68	68	68	0	**YES**
N12	Humboldt Pkwy	B (67)	7	68	68	68	0	**YES**
N13	Humboldt Pkwy	B (67)	2	68	69	69	1	**YES**

NOTES: (1) - An impact occurs if the Build Alternative noise level is 6 dB(A) or greater than the existing level OR the noise level approaches or exceeds the NAC, where “approach” is defined as 1 dB(A) below the NAC of 67 dB(A) for Activity Categories B and C.

TABLE 7-7 ANALYSIS AREA O Westbound Side of NYS Rte. 198 Between Kensington and East Limits TRAFFIC NOISE LEVELS (Leq)								
Receiver Site	Location	FHWA Activity Category (NAC in dB(A))	Number of Dwelling Units	Existing Noise Levels (dB(A))	Predicted 2040 Future Noise Levels (dB(A))		Noise Level Differences (Build - Existing)	Impact[(1)]
					No-Build	Build		
O1	Humboldt Pkwy	B (67)	4	68	68	69	1	**YES**
O2	Humboldt Pkwy	B (67)	1	67	67	68	1	**YES**
O3	Humboldt Pkwy	B (67)	4	67	67	68	1	**YES**
O4	Humboldt Pkwy	B (67)	4	68	68	69	1	**YES**
O5	Humboldt Pkwy	B (67)	2	70	70	70	0	**YES**
O6	Humboldt Pkwy	B (67)	1	70	70	71	1	**YES**
O7	Humboldt Pkwy	B (67)	9	70	70	70	0	**YES**
O8	Humboldt Pkwy	B (67)	3	69	69	69	0	**YES**
O9	Humboldt Pkwy	B (67)	3	67	67	67	0	**YES**
O10	Humboldt Pkwy	B (67)	4	66	67	67	1	**YES**
O11	Humboldt Pkwy	B (67)	3	66	67	67	1	**YES**
O12	Humboldt Pkwy	B (67)	3	64	64	64	0	**NO**

NOTES: (1) - An impact occurs if the Build Alternative noise level is 6 dB(A) or greater than the existing level OR the noise level approaches or exceeds the NAC, where “approach” is defined as 1 dB(A) below the NAC of 67 dB(A) for Activity Categories B and C.

The results indicate that the Build Alternative would reduce traffic noise levels at 2 of the 20 project analysis areas (B and E), and at 16 of the 20 project analysis areas (A, C, D, F, G, H, I, J, K, L, M, P1, P2, P3, P4, and P5) the noise levels are not anticipated to change. At analysis areas N, and O, the greatest increase in traffic noise levels from the existing conditions to the Build Alternative is 1 dB(A). According to the FHWA's "Highway Traffic Noise: Analysis and Abatement Guidance," 3 dB(A) increases are barely perceptible by the human ear.

7.2.2 Noise Impact Determination

A traffic noise impact can be expected from a project if one or both of the following occurs:

1. The predicted future traffic noise levels approach or exceed the NAC as specified in **Table 5-1** ("Approach" is defined as within 1 dBA of the NAC.)
2. The predicted future traffic noise levels exceeds existing noise levels by 6 dBA or more ("substantial increase").

The predicted future traffic noise levels approach or exceed the NAC established for Land Use Categories B and C for 45 analysis sites (145 dwelling unit receptors and 6 equivalent residential receptors for park areas). For the remaining sites, the future predicted traffic noise levels do not approach or exceed the NAC, nor do they cause substantial increases of 6 dB(A) or greater over existing noise levels. Noise impacts were identified at receivers within analysis locations G, H, L, M, N, and O due to predicted future traffic noise levels approaching or exceeding the NAC established for Land Use Categories B and C (see Table 7-2 through Table 7-7). When noise impacts are predicted for a project, noise abatement must be considered for each impact. Therefore, noise abatement measures were considered for the Build Alternative.

8.0 NOISE ABATEMENT

Noise abatement measures were considered for those sites where traffic noise impacts were determined to occur. When noise abatement measures are being considered, NYSDOT Noise Policy requires that every reasonable effort must be made to obtain noise reductions of 10 or more dB(A). For a measure to be deemed feasible, it must provide a minimum 5 dB(A) reduction to the majority of impacted receptors. In addition, noise abatement measures must meet NYSDOT-established reasonableness cost indices ($80,000 per benefited receptor for a noise berm or noise insulation; 2,000 square feet of wall per benefited receptor for barrier walls). A benefited receptor is any receptor where the noise level is reduced by 5 dBA or more by implementation of the noise abatement measure(s). In addition, for an abatement measure to be deemed reasonable, a majority of the benefited receptors must achieve the noise reduction design goal of 7 dB(A).

8.1 Traffic Management/Highway Design

One method of noise abatement is through traffic management, which includes specific lane designations, prohibition or time restriction of certain vehicle types, and modified speed limits. Lane designations would not be effective since the lanes are generally only two lanes wide in each direction. In addition, lane designations would not be practical since the proposed roadways have exit ramps or connecting roadways that must be maintained at all times for neighborhood residents, as well as for school busses and delivery trucks.

Prohibition or time restriction of heavy vehicles along the local roadways in these areas is not considered practical because this area of the City is a mix of commercial and residential land use where most of the heavy vehicles are delivery trucks and busses that are essential to commerce within the study area and cannot be re-routed.

Regarding speed limit reductions, it is not practical to reduce the speed limit on this corridor below 30 mph.

Due to the ineffectiveness and impracticality of these methods, traffic management is not a practical method for noise abatement for this project.

8.2 Alteration of Horizontal and Vertical Alignments

Highway design modification, such as locating the highway farther from receivers or altering profile grades, is another method of noise abatement. Potential changes in horizontal or vertical alignment were evaluated to determine if these measures would be feasible and reasonable for this project.

Evaluation of vertical alignment changes:

Reduction of noise levels through modification of the vertical profile of the Build Alternative would be due to the reduction of the line-of-sight

between the vehicular noise sources (tire noise and exhaust pipes) and the receivers. Most automobiles and light trucks have exhaust pipes located at approximately 0.3 to 0.6 meters (1-2 feet) above the roadway surface, however, it should be noted that many trucks/busses have exhaust pipes that outlet at approximately 3 meters (9.8 feet) above the roadway surface. Options for changes in vertical alignment include the following:

1. Lowering the roadway - Depending on the elevation of the receptors and location with respect to the roadway, NYS Route 198 would have to be lowered approximately 1-2 meters (3.3-6.6 feet) in the area of the impacted receivers to *begin* to reduce noise levels; however, reduction of noise levels to an extent that would justify implementation of an abatement measure would likely require a more extreme change in the vertical alignment. It should be noted that the elevation of NYS Route 198 in front of Receiver M is substantially lower than the receiver location and a traffic noise impact is still predicted at that location.

   Engineering obstacles for lowering the roadway elevation include side-street tie-ins, potential flooding concerns and the likely requirement of pumping stations for stormwater drainage along the corridor.

2. Raising the roadway - The roadway would have to be raised over 2-3 meters (6.6-9.8 feet) to *begin* to reduce noise levels to adjacent residences. However, reduction of noise levels to an extent that would justify implementation of an abatement measure would likely require a more extreme change in the vertical alignment. Engineering obstacles for raising the roadway elevation include side-street tie-ins and high costs.

In general, due to the above mentioned engineering obstacles for raising or lowering the roadway, construction of vertical alignment changes are not feasible and/or reasonable in the areas of the impacted receivers. In addition, the amount of fill and right-of-way involved to raise or lower the roadway enough to obtain an acceptable reduction in noise levels at the impacted receiver locations would be cost prohibitive and involve property acquisitions.

Evaluation of horizontal alignment changes:

Generally, a large shift of 100 feet or more is needed to yield noise reductions large enough to justify implementation of horizontal alignment change as an abatement measure. For each of the impacted receivers, there are noise sensitive receptors on both sides of the road since NYS Route 198 is centered between either residential properties or parkland in these impacted areas. If the roadway alignment were to be substantially shifted to either direction, the higher noise levels would be shifted toward the receptors on the other side of the roadway. Therefore, a horizontal

alignment change is not a feasible and/or reasonable method for noise abatement along the project corridor.

Due to the ineffectiveness and impracticality of these methods, alteration of horizontal or vertical alignments was dismissed from further consideration.

8.3 Noise Barriers

To determine whether noise barriers would be feasible and reasonable for this project, noise barrier analyses were performed for the analysis areas G, H, L, M, N, and O, since noise impacts occur at 45 analysis sites within these areas, as shown above in **Table 7-2** through **Table 7-7**. The evaluated noise barriers are presented on **Figure NB1** and **Figure NB2** of **Attachment A**. The evaluated noise barriers include:

Barrier G – located along Eastbound NYS Rte. 198 in Delaware Park between Lincoln Avenue and the Pedestrian Bridge.

Barrier H – located along Westbound NYS Rte. 198 in Delaware Park between Lincoln Avenue and Delaware Avenue.

Barrier L – located along Eastbound NYS Rte. 198 between Parkside Avenue and Main Street.

Barrier M – located along Westbound NYS Rte. 198 between Parkside Avenue and Main Street.

Barrier N – located along Eastbound NYS Rte. 198 between Glendale Place and Hughes Avenue.

Barrier O – located along Westbound NYS Rte. 198 between Kensington and Oak Grove Avenue.

To be recommended, a noise barrier must be both feasible and reasonable.

Feasibility

Feasibility involves the practical capability of the noise abatement measure being built as well as the capacity to achieve a minimum reduction in noise levels. In regards to acoustical feasibility, when noise abatement measures are being considered, every reasonable effort must be made to obtain noise reductions of 10 or more dB(A). For a measure to be deemed feasible, it must provide a minimum 5 dB(A) reduction to the majority of impacted receptors.

Reasonableness

Viewpoints: If a noise abatement measure is deemed feasible, meets the reasonableness cost index, and meets the noise reduction design goal, the viewpoints of property owners and residents are solicited. A response must be

obtained from at least half of the benefited property owners and residents and a majority of the responses must favor the abatement measure to be deemed reasonable.

Cost: NYSDOT has established the following reasonableness cost index for barrier walls as abatement measures: a maximum of 2,000 square feet (185 square meters) of wall per benefited receptor. All owner-occupied and rental dwelling units; detached, duplex, and mobile homes; and multifamily apartment units are counted if they are benefited, regardless of whether or not they were identified as impacted. The threshold of noise reduction that establishes a "benefited" property is at least 5 dB(A) determined at a point where frequent human use occurs and a lowered noise level would be of benefit.

Noise Reduction: NYSDOT Noise Policy establishes a Noise Reduction Design Goal of 7 dB(A). For an abatement measure to be determined reasonable, a majority of the benefited receptors must achieve the design goal. For example, if 10 receptors were "benefited" (i.e., would receive at least a 5 dB(A) noise reduction if the abatement measure were implemented), then at least 6 receptors must receive a 7 dB(A) noise reduction for the abatement measure to be considered reasonable under this criteria.

Each criterion (viewpoints, cost, and noise reduction) must be met for the measure to be considered reasonable for implementation.

The results of each evaluated barrier, including barrier location, existing hourly L_{eq} noise levels, future hourly L_{eq} noise levels without and with a barrier, barrier length and height, and the range of noise reduction provided by the barrier are presented in **Table 8-1**. The total number of impacts and benefits, the number of impacted receptors that would experience at least a 5 dB(A) noise reduction, the number of benefited receptors with 7 dB(A) or more attenuation, the cost reasonableness index (based on a barrier wall square area value per benefited receptor), the number of benefited receptors (i.e., residential, commercial, or equivalent), the cost per benefited receptor, acoustical feasibility determination, and feasibility and reasonableness determination for each of the barriers is presented in **Table 8-2**.

TABLE 8-1
EVALUATED NOISE BARRIERS

Noise Barrier ID	Figure	Location	Existing L_{eq}(1hr) Noise Levels, dB(A)	Range of Future Build L_{eq}(1hr) Noise Levels, dB(A)		Barrier Characteristics	
				w/o Barrier	With Barrier	Approx. Length (m)	Avg. Height (m)
G	NB1	Delaware Park	66	66	60	155	4
H	NB1	Delaware Park & Nottingham	60-68	60-68	57-59	512	4
L	NB2	Parkside to Main	65-71	65-71	60-70	264	4.5
M	NB2	Parkside to Main	66-71	66-71	60-69	260	5
N	NB2	Glendale Place to Hughes Avenue	67-72	67-72	59-71	370	6
O	NB2	Kensington to Oak Grove Avenue	64-70	64-71	59-70	291	6

TABLE 8-2
NOISE BARRIER FEASIBILITY AND REASONABLENESS

Noise Barrier ID		Number of Attenuated Locations					Sq-m of Modeled Noise Barrier	Sq-m of Wall Per Benefited Receptor	Feasible (Y / N)	Reasonable (Y / N)
	Total # of Impacts	Total # of Benefited Receptors	≥ 5 dB(A) (Impacted Receptors)		≥ 7 dB(A) (Benefited Receptors)					
			#	% of Impacted	#	% of Benefited				
G	2	2	2	100%	2	100%	620	310	Y	N
H	4	4	4	100%	4	100%	2048	512	Y	N
L	29	17	17	55%	7	41%	1188	70	Y	N
M	23	8	8	35%	5	71%	1300	163	N	Y
N	57	27	27	47%	25	93%	2220	82	N	Y
O	38	10	10	26%	7	70%	1746	175	N	Y

The evaluated noise barriers for analysis areas G and H were found to satisfy NYSDOT's feasibility criteria but did not pass the reasonableness criteria because these evaluated barriers resulted in a square-meter of wall per benefited

receptor value that is above the allowable 2000 sq-ft (185 sq-m) value. The evaluated noise barrier for analysis area L was found to satisfy NYSDOT's feasibility criteria but did not pass the reasonableness criteria because there was not a majority of the benefited receptors achieving the noise reduction design goal. The remaining evaluated barriers (M, N and O) were found to satisfy NYSDOT's reasonableness criteria but did not pass the acoustical feasibility because none of these evaluated barriers would provide the minimum 5 dB(A) reduction to the majority of impacted receptors. As none of the barriers were both reasonable and feasible, viewpoints were not solicited.

8.4 Acquisition of Real Property to Serve as a Buffer Zone

This abatement measure allows for acquisition of real property or interests therein (predominantly unimproved property) to serve as a buffer zone to pre-empt development that would be adversely impacted by traffic noise. Since the impacted receivers are located within a developed City corridor, this would be ineffective as an abatement measure for the impacted receivers.

8.5 Summary Discussion of Noise Abatement

For the impacted areas, noise abatement measures were evaluated (see Sections 8.1 through 8.4). None of the noise abatement measures met the established criteria for feasibility and reasonableness.

9.0 CONSTRUCTION NOISE

Construction noise differs from traffic noise in the following ways:

- Construction noise only lasts for the duration of the construction contract.
- Construction activities are generally short term.
- Construction noise is intermittent and depends on the type of operation.

Short-term construction noise from activities, such as earthwork, land clearing, pile driving, paving, and structure demolition and construction, could affect abutting receptors. Noise and vibration levels due to construction at specific locations are a function of the number and types of construction equipment that would be utilized for a specific phase of project construction, and are highly variable throughout the various phases of construction.

Night time construction would generally be avoided but may need to be considered on a limited basis to avoid traffic congestion that would result if those operations were performed during daytime hours. The City of Buffalo noise ordinance (Chapter 293) prohibits unreasonable noise, which includes construction work between the hours of 9 PM and 7 AM. NYSDOT activities are not subject to local noise ordinances; however, NYSDOT would make reasonable effort to comply with the provisions of the City of Buffalo's ordinance.

Construction noise abatement measures would be evaluated during final design. Examples of construction noise abatement techniques include locating high noise level equipment away from sensitive receptors, awareness of potential noise problems and complaints, and maintenance of proper muffling devices.

10.0 STATEMENT OF LIKELIHOOD

Based on the studies performed thus far, NYSDOT recommends no noise abatement measures for this project. A final decision on the recommendations would be made upon completion of the project design and public involvement process (as applicable).

11.0 COORDINATION WITH LOCAL OFFICIALS

Noise-compatible land use planning can help to minimize future traffic noise impacts in the vicinity of highway projects. As stated in NYSDOT Noise Policy, the effective implementation of noise-compatible planning measures is a shared responsibility between NYSDOT and local governments. As such, the following information is being provided to inform local officials of the noise levels that could be expected by the Build Alternative at various distances from NYS Route 198 in the vicinity of the noise study area, and techniques that could be used to prevent future traffic noise impacts.

A. Recommended Distances from Human Activities - The calculated distances between the median of NYS Route 198 and various noise contours are based upon TNM 2.5 computed future loudest hour traffic noise levels, and are provided in **Table 11-1**.

TABLE 11-1
INFORMATION FOR LOCAL OFFICIALS

Recommended Distance Needed from the Highway Median to a Specified L_{eq} Noise Level (ft)			
Location		**Human Activity is Predominately Outdoor (Indoor and Building would Provide 20 dB(A) Reduction) (1)**	**FHWA NAC "B" (2)**
Main Highway Segment Limits	Main Hwy.	**61 dB(A)**	**66 dB(A)**
Grant Street to Elmwood Ave.	NYS Route 198	200	105
Elmwood Ave. to Delaware Ave.	NYS Route 198	210	140
Delaware Ave. to Parkside Ave.	NYS Route 198	190	105
Parkside Ave. to Main Street	NYS Route 198	240	160
Kensington Ave. to Eastern Limits	NYS Route 198	270	170

NOTES:
(1) The recommended distance for outdoor activities is measured from the centerline of the highway median (or highway directional lanes) to the limit of the "active use area." The 61 dB(A) is more conservative than the FHWA NAC 'B' of 66 dB(A), but provides a greater quality of life and lower annoyance. The recommended distance for indoor activities is measured from the centerline of the highway median (or highway directional lanes) to the building structure. It is assumed that building structures provide a 20 dB(A) reduction from building construction with central HVAC and double pane, non-opening windows.
(2) The recommended distance is measured from the centerline of the highway median (or highway directional lanes) of NYS Route 198 to the limit of the "active use area." The 66 dB(A) represents the FHWA NAC for Activity Category B & C.

B. Noise Compatible Land Use Planning References - Reference information such as "The Audible Landscape" found at www.fhwa.dot.gov/environment/audible/index.htm and "Entering the Quiet Zone" found at www.fhwa.gov/environment/noise/quietzone/index.htm may be useful to local communities in protecting future land development from becoming incompatible with anticipated highway noise levels.

12.0 REFERENCES

1. NYSDOT, The Environmental Manual (TEM), prepared by the NYSDOT Engineering Division - Office of Environment, April 2011. Section 4.4.18 - Noise Analysis Policy and Procedures (NYSDOT Noise Policy)

2. Field Measurement of Existing Noise Levels, prepared by Noise Measurement Unit, Materials Bureau, NYSDOT, May 1986.

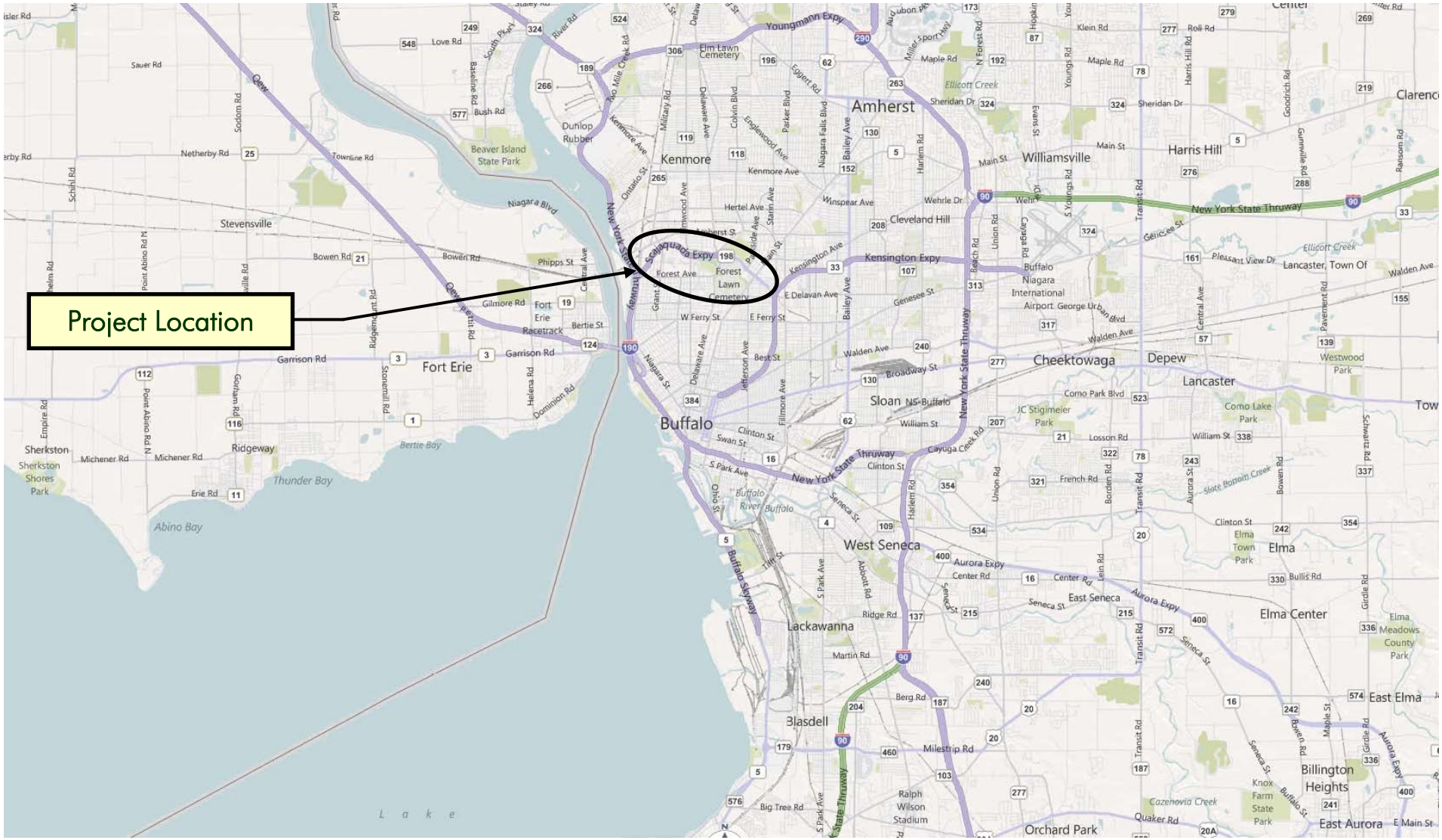
3. FHWA Traffic Noise Model (TNM) 2.5: User's Guide, Federal Highway Administration, April 2004.

4. FHWA Traffic Noise Model (TNM) 1.0: Technical Manual, Federal Highway Administration, February 1998 (including updates to 2.5).

5. Federal-Aid Policy Guide, Subchapter H, Part 772 of Title 23 of the Code of Federal Regulations, Federal Highway Administration, Washington, D.C., December 9, 1991, Transmittal 1.

ATTACHMENT A

Project Location Map, Noise Receptor Locations, Barrier Figures



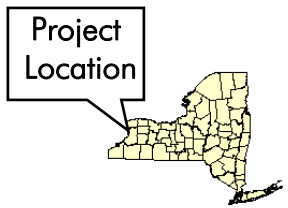
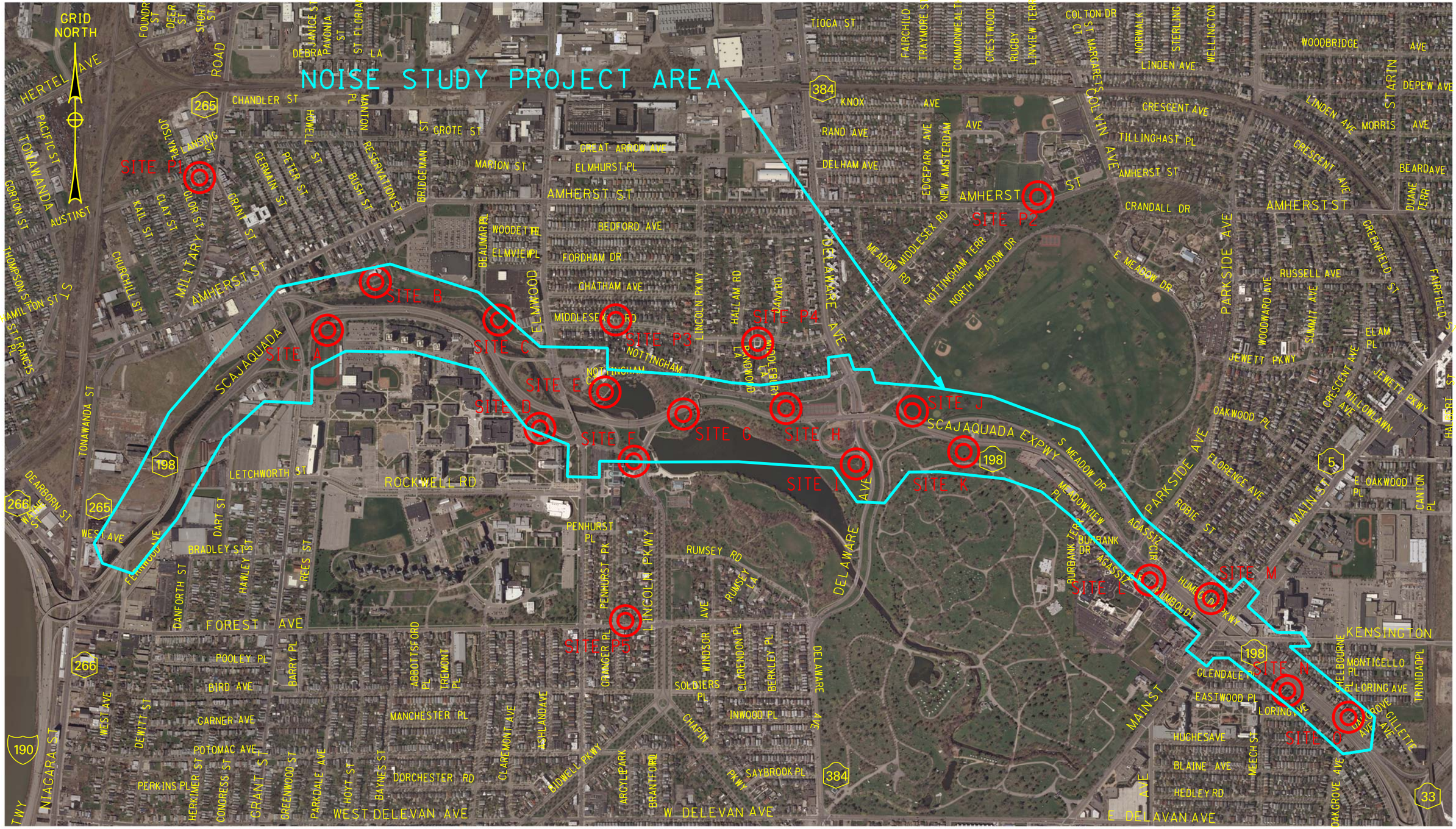


FIGURE 1 – PROJECT LOCATION MAP

NYS Route 198 – Scajaquada Expressway
PIN 5470.22
Buffalo, Erie County, New York

Not to Scale	July 2016

ESTIMATED BY | DRAFTED BY | CHECKED BY | DESIGNED BY | JOB MANAGER | DESIGN SUPERVISOR



NOTES:
1) ORTHOPHOTOGRAPH BASEMAP IS FROM THE NEW YORK STATE GIS GATEWAY .

LEGEND

TRAFFIC NOISE STUDY RECEPTORS

FIGURE 2	
NOISE STUDY RECEPTORS	
PIN 5470.22, NY 198 (SCAJAQUADA) CORRIDOR BUFFALO, NEW YORK	
1:12,000 (11"x17" plot)	July 2016

Figure NB1 - Evaluated Noise Barriers (Area G and Area H)

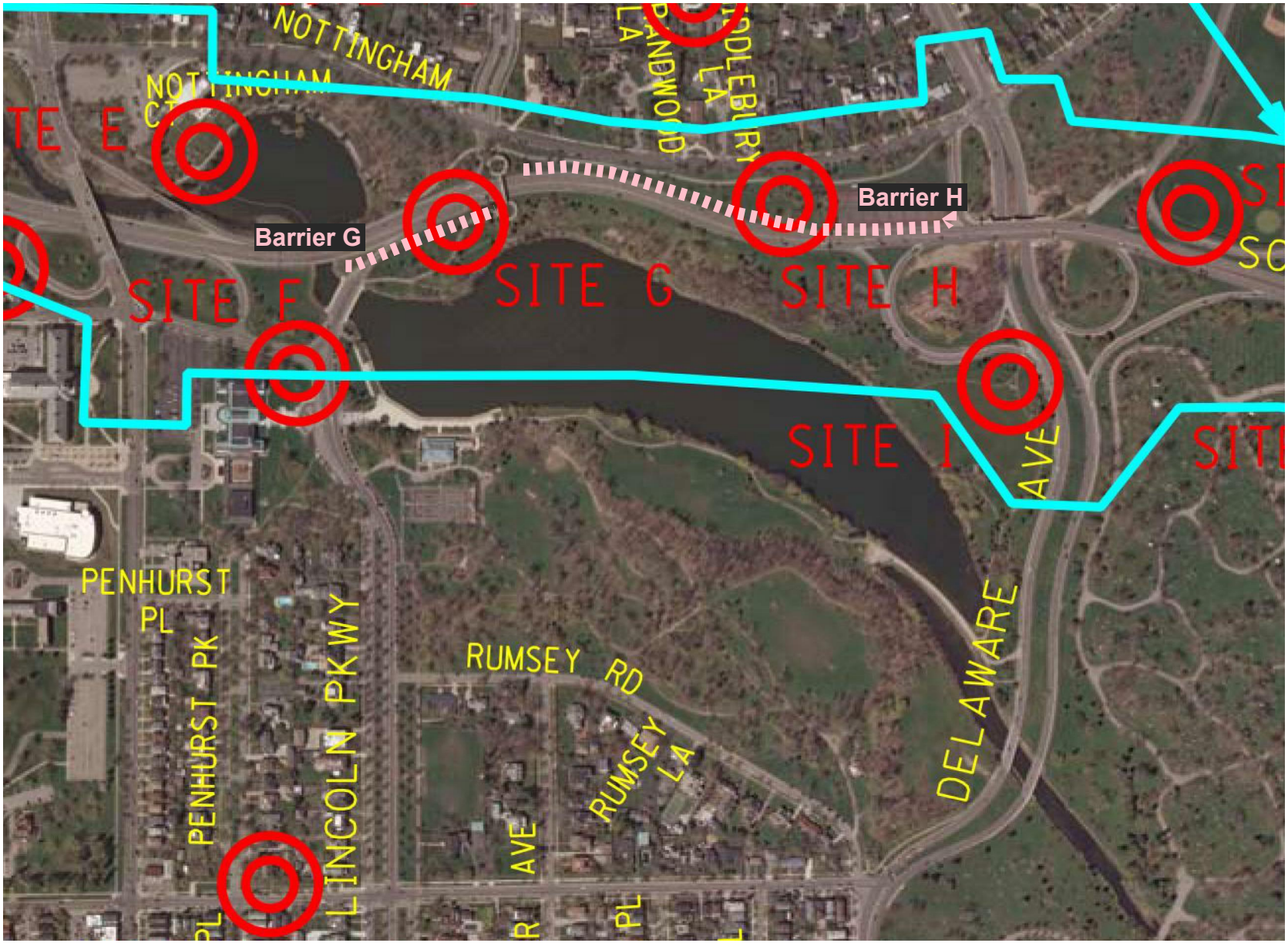
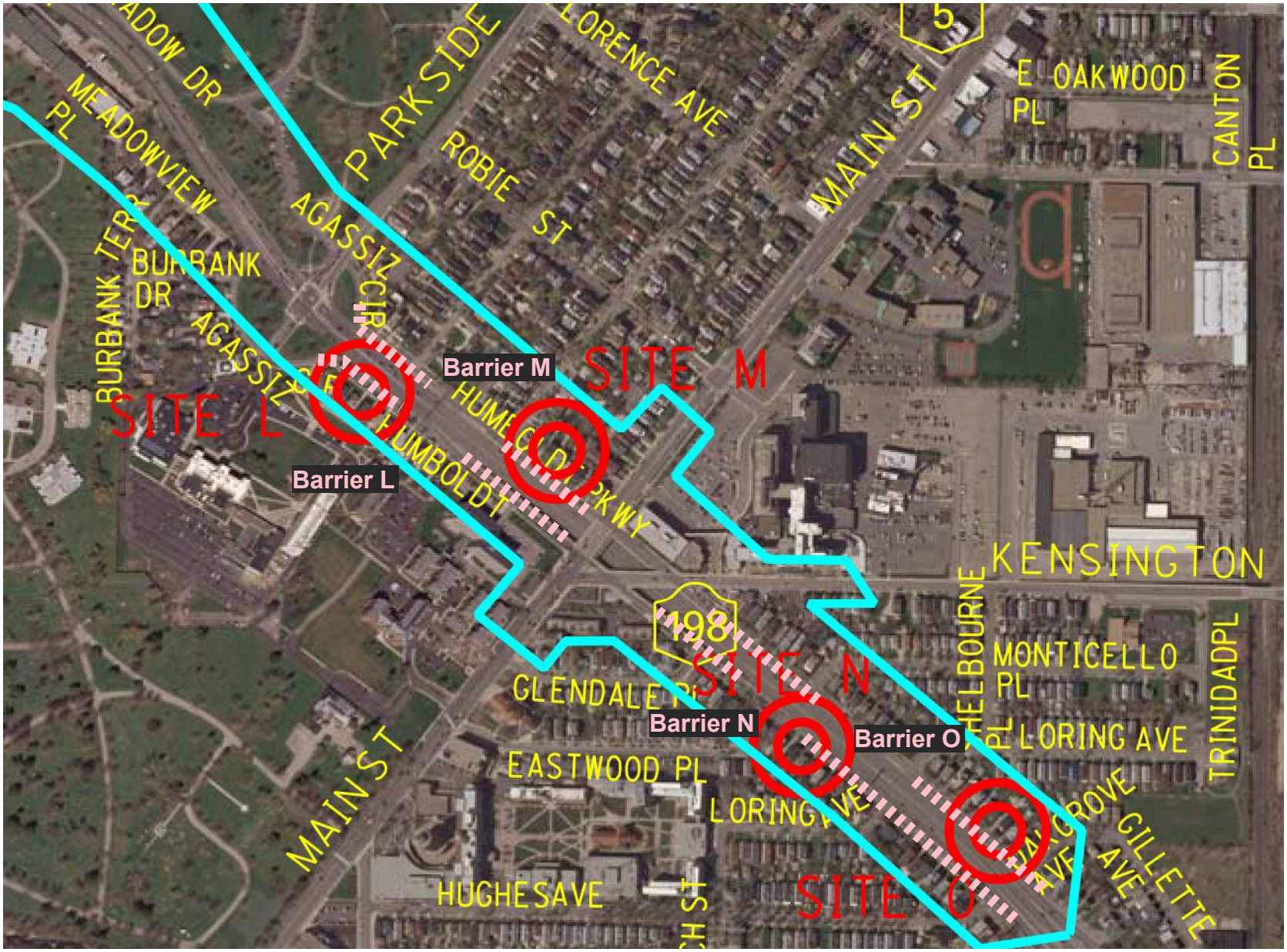


Figure NB2 - Evaluated Noise Barriers (Area L, Area M, Area N and Area O)



ATTACHMENT B

Field Noise Monitoring Logs

Peak

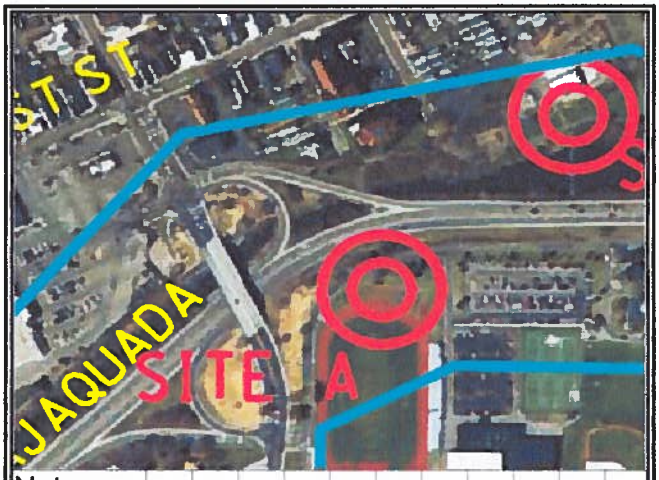
Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 2/8/2012
PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22
PERSONNEL: RS, GM, MM, PGP

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* 113.1 dBA *After:* 115.0 dBA

WIND: CALM
DIRECTION:
TEMPERATURE: 23° F
HUMIDITY: 78%

LOCATION DIAGRAM



Notes:

RECEPTOR I.D. A

RUN TIME	NOISE LEVEL dBA	COMMENTS

RUN 8

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	60.5	60.7	60.8		
Start Time 7:49	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

RS - C1 WB C-2 GM - 64 EB C-8 MM 62 ROAD C-6 PGP PAPER DRIVEWAY

Off-Peak

Watts Architecture & Engineering, P.C.
NOISE SURVEY

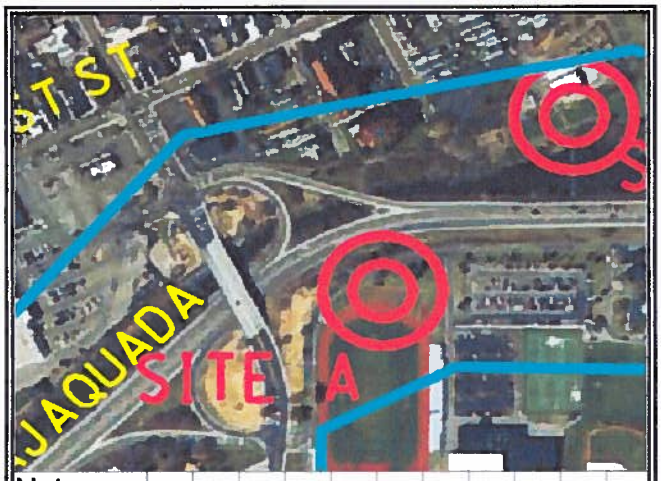
DATE: 2/8/2012
PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22
PERSONNEL: RS, GM, MM, PGP

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* 114.0 dBA *After:* 114.0 dBA

WIND: CALM
DIRECTION:
TEMPERATURE: 24 °F
HUMIDITY: 75%

RUN TIME	NOISE LEVEL dBA	COMMENTS

LOCATION DIAGRAM



Notes:

RECEPTOR I.D. A

RUN 11

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	57.1	58.1	57.8	57.7	
Start Time 9:43	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

MM - 62 C-9 ROAD
GM - 64 C-11 198 EB
RS - T 58 C-5 198 WB
PGP - PAPER DRIVEWAY

Peak

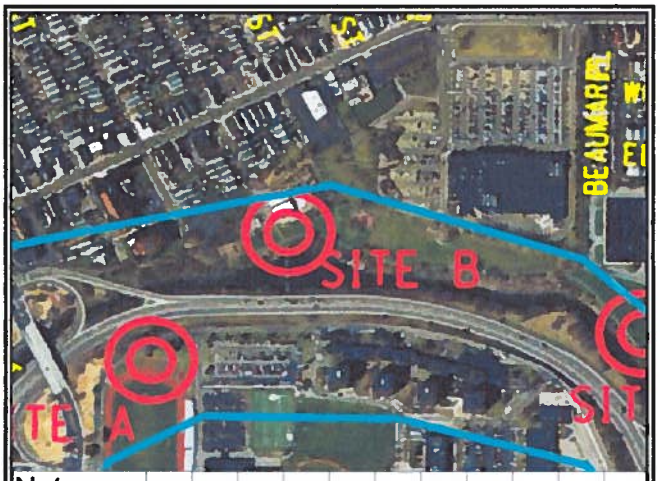
Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 12/01/2011
PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22
PERSONNEL: PGP, MG, MH

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* ____ dBA *After:* ____ dBA

WIND: 4 MPH DIRECTION: SSW
TEMPERATURE: 33°F
HUMIDITY: 82%

LOCATION DIAGRAM



Notes:

RECEPTOR I.D. B

RUN TIME	NOISE LEVEL dBA	COMMENTS

RUN 009

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	67.2	69.6	66.7	66.9	66.7
Start Time 7:54	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

MH DI-0362 198-EB COUNT 1 MG DI-0363 198-WB COUNT 1

Off-Peak

Watts Architecture & Engineering, P.C.
NOISE SURVEY

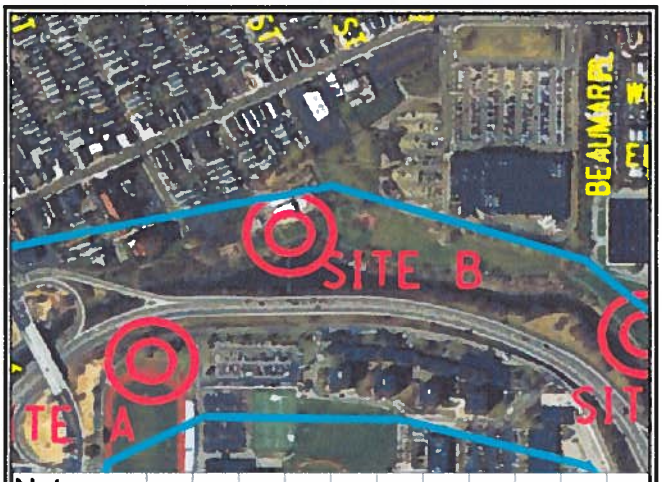
DATE: 12/01/2011
PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22
PERSONNEL: PGP, MG, MH

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* ____ dBA *After:* ____ dBA

WIND: 8 MPH DIRECTION: SW
TEMPERATURE: 40° F
HUMIDITY: 76 %

RUN TIME	NOISE LEVEL dBA	COMMENTS
0:55	71	HELICOPTER

LOCATION DIAGRAM



Notes:

RECEPTOR I.D. B

RUN 12

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	63.9	63.5	63.2	63.0	
Start Time 10:07	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

MH DI-0362 - RTE 198 - EB
COUNT 4

MG - DI-0363 - RTE 198 - WB
COUNT 4

Peak

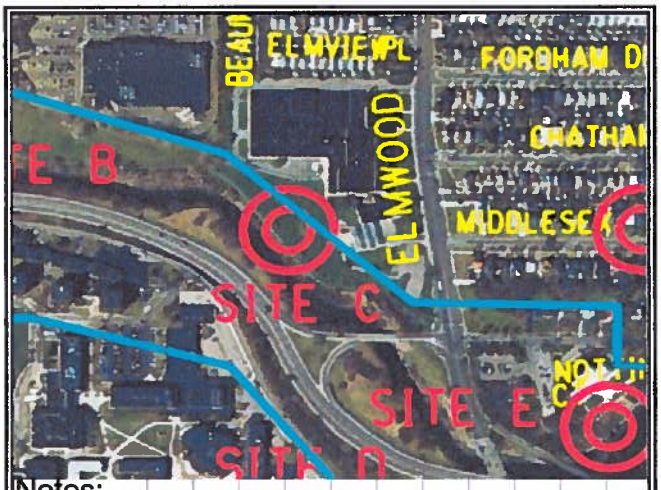
Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 12/01/2011
PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22
PERSONNEL: PGP, MG, MH

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* ____ dBA *After:* ____ dBA

WIND: 6 MPH DIRECTION: SSW
TEMPERATURE: 35 °F
HUMIDITY: 82%

LOCATION DIAGRAM



Notes:

RECEPTOR I.D. C

RUN TIME	NOISE LEVEL dBA	COMMENTS

RUN 010

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	63.2	62.7	62.3	61.9	61.7
Start Time 8:36	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

MH DI-0362 RTE 198 - EB COUNT 2

MG DI-0363 RTE 198 - WB COUNT 2

Off-Peak

Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 12/01/2011
PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22
PERSONNEL: PGP, MG, MH

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* ____ dBA *After:* ____ dBA

WIND: 6 MPH DIRECTION: SSW
TEMPERATURE: 38 °F
HUMIDITY: 76%

RUN TIME	NOISE LEVEL dBA	COMMENTS
1:50	60.7	BACK-UP ALARM
1:50	60.7	CORE DRILL
	69.3	BACK-UP ALARM
	61.0	BACK-UP ALARM

LOCATION DIAGRAM

Notes:

RECEPTOR I.D. C

RUN 11

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	61.2	60.9	60.9		
Start Time 9:38	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

MH DI-0362 RTE-198-EB COUNT 3

MG DI-0363 RTE 198-WB COUNT 3

Peak

Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 2/8/2012
PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22
PERSONNEL: RS, GM, MM, PGP

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* 114.0 dBA *After:* ____ dBA

WIND: CALM
DIRECTION: ____
TEMPERATURE: 23 °F
HUMIDITY: 78 %

RUN TIME	NOISE LEVEL dBA	COMMENTS
10:00		FAN TURBINE

LOCATION DIAGRAM

Notes:

RECEPTOR I.D. D

RUN 9

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	64.9	64.7	64.9		
Start Time 8:27	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

RS - NB GM - EB M - 62 ROAD C-7 PGP PAPER RAMP

Off-Peak

Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 2/8/2012
PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22
PERSONNEL: RS, GM, MM, PGP

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* 114.0 dBA *After:* 113.6 dBA

WIND: CALM DIRECTION:
TEMPERATURE: 23 °F
HUMIDITY: 78%

RUN TIME	NOISE LEVEL dBA	COMMENTS

LOCATION DIAGRAM

Notes:

RECEPTOR I.D. D

Run 10

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	64.7	64.5	64.6		
Start Time 9:06	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

M- ROAD 62
GM - EB 64
RS - WB 58
PGP - PAPER RAMP

Peak

Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 12/08/2011 PROJECT NAME: Rt. 198, Scajaquada Expressway

LOCATION: Buffalo, New York

JOB NO: Y6197

PIN NO: 5470.22 PERSONNEL: PGP, MG

INSTRUMENT: CASELLA CEL-633C

S/N: 2911023

WEIGHTING: A

CALIBRATION: *Before:* 112.9 dBA *After:* 115.0 dBA

WIND: 6 MPH DIRECTION: W

TEMPERATURE: 33°F

HUMIDITY: 66%

RUN TIME	NOISE LEVEL dBA	COMMENTS

LOCATION DIAGRAM

Notes:

RECEPTOR I.D. E

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	63.3	63.3	63.3		
Start Time 8:11	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

MG DI-0363 COUNT 7
198 RAMP

198 Field Survey Sheets v01.xlsx

Off-Peak

Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 12/07/2011
PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22
PERSONNEL: PGP, MPG

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* 113.5 dBA *After:* 115.1 dBA

WIND: 6 DIRECTION: N
TEMPERATURE: 34° F
HUMIDITY: 82%

LOCATION DIAGRAM

Notes:

RECEPTOR I.D. E

RUN TIME	NOISE LEVEL dBA	COMMENTS
0:50	75	SIREN

Run 24

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	62.5	61.8	61.2	61.0	61.1
Start Time 10:19	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

MG DI-0363 COUNT 1
198 RAMP

Peak

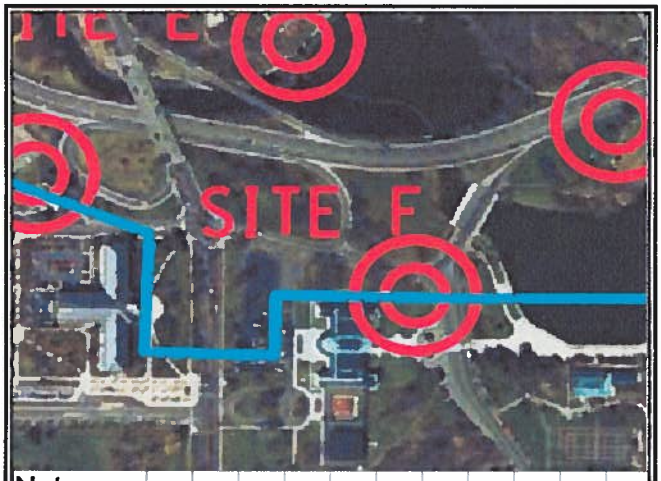
Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 12/08/2011 PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22 PERSONNEL: PGP, MG

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* 115.0 dBA *After:* 114.2 dBA

WIND: 6 MPH DIRECTION: W
TEMPERATURE: 33° F
HUMIDITY: 66 %

LOCATION DIAGRAM



Notes:

RECEPTOR I.D. F

RUN TIME	NOISE LEVEL dBA	COMMENTS

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	62.8	62.4	62.4		
Start Time 8:36	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

MG - DI-6363 - COUNT 8

Off-Peak

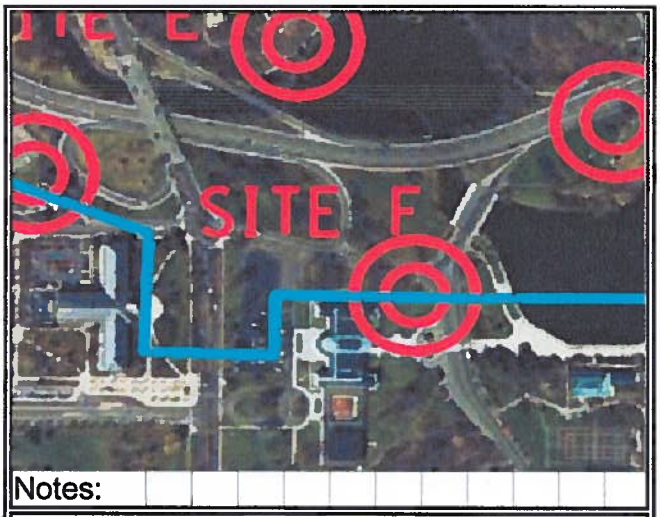
Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 12/07/2011 PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22 PERSONNEL: PGP, MPG

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* 113.8 dBA *After:* 112.9 dBA

WIND: CALM DIRECTION:
TEMPERATURE: 35° F
HUMIDITY: 70%

LOCATION DIAGRAM



Notes:

RECEPTOR I.D. F

RUN TIME	NOISE LEVEL dBA	COMMENTS

RUN 29

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	63.1	63.6	63.6		
Start Time 15:15	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

MPG - D1-0363 - COUNT 6

Peak

Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 2/3/2012 PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22 PERSONNEL: RS, GM, PGP

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* 112.8dBA *After:* 114.6dBA

WIND: CALM DIRECTION:
TEMPERATURE: 32° F
HUMIDITY: 73%

LOCATION DIAGRAM

Notes:

RECEPTOR I.D. G

RUN TIME	NOISE LEVEL dBA	COMMENTS

RUN 4

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	72.0	72.3	72.4		
Start Time 7:13	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

GM · 64 EB
C-4
AUTO-5

RS · 62 WB
C-2
AUTO-16

Off-Peak

Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 12/01/2011 PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22 PERSONNEL: PGP, MG

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* ____ dBA *After:* ____ dBA

WIND: 10 MPH DIRECTION: SW
TEMPERATURE: 42° F
HUMIDITY: 79 %

LOCATION DIAGRAM

Notes:

RECEPTOR I.D.	G

RUN TIME	NOISE LEVEL dBA	COMMENTS

RUN 16

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	66.8	66.8	66.8		
Start Time 13:15	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

COUNT - 7 - 63 198

Peak

Watts Architecture & Engineering, P.C.
NOISE SURVEY

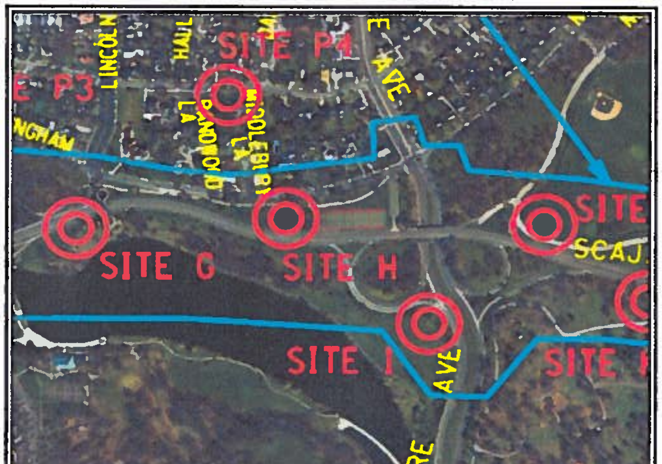
DATE: 12/2/2011
PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22
PERSONNEL: PGP, MH, MG

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* ____ dBA *After:* ____ dBA

WIND: 8 MPH DIRECTION: SW
TEMPERATURE: 37° F
HUMIDITY: 76%

RUN TIME	NOISE LEVEL dBA	COMMENTS
7:23		START

LOCATION DIAGRAM



Notes:

RECEPTOR I.D. H

Run 21

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	69.5	69.6	69.5		
Start Time 7:23	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

MH ID 62 Count 9 - 198 E PP ID 1958 Count 1 Nottingham
MG ID 63 Count 11 - 198W

Off-Peak

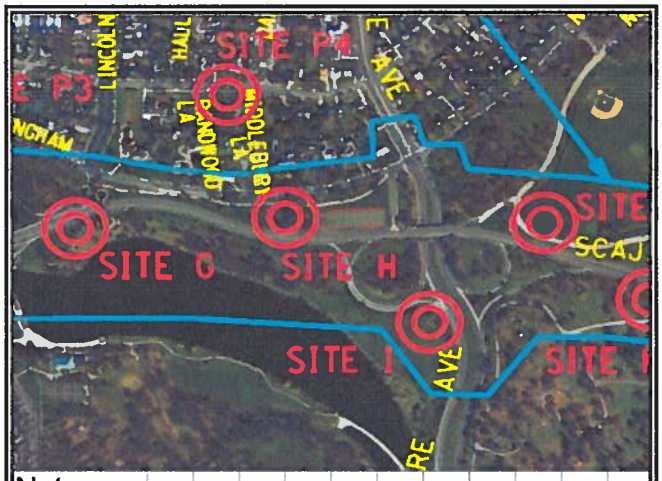
Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 12/1/2011 PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22 PERSONNEL: PGP, MG

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* ____ dBA *After:* ____ dBA

WIND: 10 MPH DIRECTION: WSW
TEMPERATURE: 42° F
HUMIDITY: 76%

LOCATION DIAGRAM



Notes:

RECEPTOR I.D. H

RUN TIME	NOISE LEVEL dBA	COMMENTS
20:45	90.6	SIREEN

RUN 017

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	68.9	68.8	68.5	68.8	69.7
Start Time 13:56	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

MG - DI-0363 - 198 COUNT 8

PGP - DI-0362 - NOTTINGHAM COUNT 7

Peak

Watts Architecture & Engineering, P.C.
NOISE SURVEY

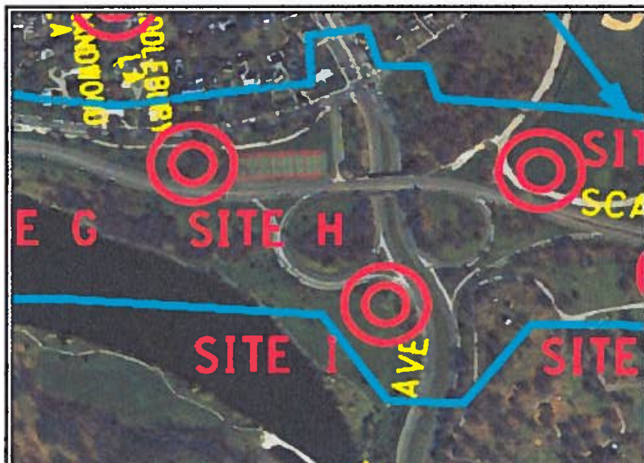
DATE: 2/3/2012 PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22 PERSONNEL: RS, GM, PGP

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* 114.3 dBA *After:* 114.1 dBA

WIND: CALM DIRECTION:
TEMPERATURE: 32° F
HUMIDITY: 73%

RUN TIME	NOISE LEVEL dBA	COMMENTS

LOCATION DIAGRAM



Notes:

RECEPTOR I.D. I

RUN 5

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	60.6	60.7	60.6		
Start Time 7:50	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

GM- 64 C-5 RAMP OFFSITE RS - 62 C-3 DEL.

Off-Peak

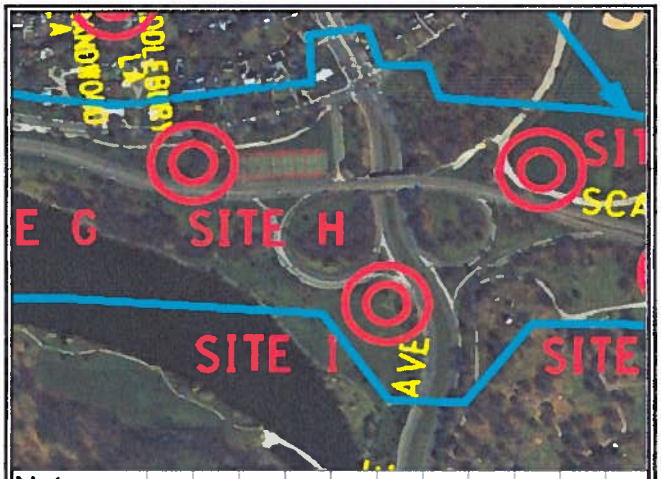
Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 12/01/2011 PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22 PERSONNEL: PGP, MG, MH

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* ____ dBA *After:* ____ dBA

WIND: 10 MPH DIRECTION: WSW
TEMPERATURE: 42° F
HUMIDITY: 79 %

LOCATION DIAGRAM



Notes:

RECEPTOR I.D. I

RUN TIME	NOISE LEVEL dBA	COMMENTS
8:50	72.2	FIRE TRUCK
9:40	73.3	SIREN

RUN #4 15

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	58.5	62.3	61.7	61.4	61.1
Start Time 11:28	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

MH DI-0362 COUNT 6 RAMP

MG DI-0363 COUNT 6 DELAWARE AVE

Peak

Watts Architecture & Engineering, P.C.
NOISE SURVEY

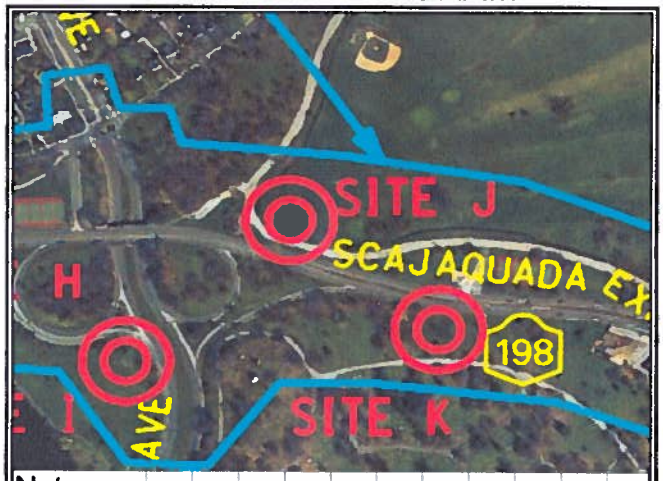
DATE: 12/2/2011
PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22
PERSONNEL: PGP, MH, MG

INSTRUMENT: CASELLA CEL-633C
S/N:
WEIGHTING: A
CALIBRATION: *Before:* ____ dBA *After:* ____ dBA

WIND: 8 MPH DIRECTION: SW
TEMPERATURE: 37° F
HUMIDITY: 79% (LIGHT RAIN)

RUN TIME	NOISE LEVEL dBA	COMMENTS
19:50	70	Dog

LOCATION DIAGRAM



Notes:

RECEPTOR I.D. J

RUN 22

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	64.5	64.2	64.6	69.9	
Start Time 7:55 AM	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

MG - 63 (12) WB 198
MH - 62 (10) EB 198

Off-Peak

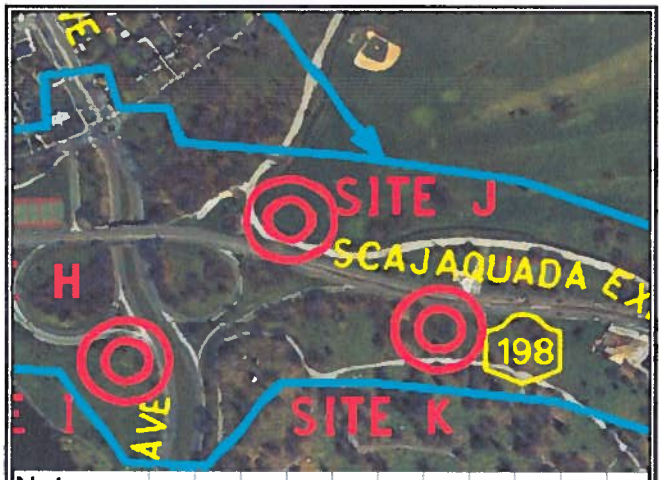
Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 12/07/2011
PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22
PERSONNEL: PGP, MG

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* 114.2 dBA *After:* 113.7 dBA

WIND: 4 MPH DIRECTION: N
TEMPERATURE: 34° F
HUMIDITY: 75%

LOCATION DIAGRAM



Notes:

RECEPTOR I.D. J

RUN TIME	NOISE LEVEL dBA	COMMENTS

RUN 26

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	61.4	61.7	61.9	61.9	
Start Time 11:58	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

MG DI-0363 COUNT 3
RTE 198

Peak

Watts Architecture & Engineering, P.C.
NOISE SURVEY

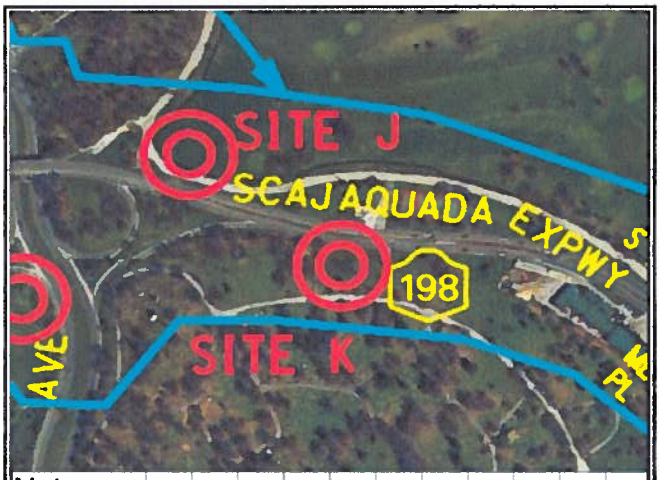
DATE: 2/3/2012 PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22 PERSONNEL: RS, GM, PGP

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* 113.8 dBA *After:* 113.9 dBA

WIND: CALM DIRECTION:
TEMPERATURE: 32° F
HUMIDITY: 73%

RUN TIME	NOISE LEVEL dBA	COMMENTS
1:00	74.	SIREN

LOCATION DIAGRAM



Notes:

RECEPTOR I.D. K

RUN 6

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	64.7	65.0	65.1		
Start Time 8:39a	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

GM - 63 C-6 EB
RS - 62 C-4 WB

Off-Peak

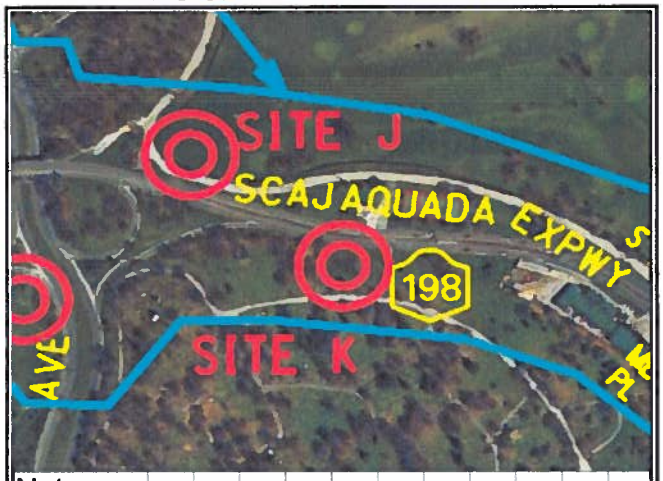
Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 12/07/2011 PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22 PERSONNEL: PGP, MG

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* 115.1 dBA *After:* 114.2 dBA

WIND: 6 MPH DIRECTION: N
TEMPERATURE: 34° F
HUMIDITY: 75%

LOCATION DIAGRAM



Notes:
RECEPTOR I.D. K

RUN TIME	NOISE LEVEL dBA	COMMENTS

RUN 25

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	65.9	65.4	65.4		
Start Time 11:05	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

MG - DI-0363 - COUNT 2
198

Peak

Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 2/9/2012
PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22
PERSONNEL: RS, GM, PGP

INSTRUMENT: Casella CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* 113.5 dBA *After:* 114.4 dBA

WIND: Calm
DIRECTION:
TEMPERATURE: 28 °F
HUMIDITY: 72 %

LOCATION DIAGRAM

Notes:

RECEPTOR I.D. L

RUN TIME	NOISE LEVEL dBA	COMMENTS

Run 12

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	69.9	69.7	69.8		
Start Time 7:43	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

GM – EB 64 C-12
RS – WB 62 C-10
PGP – TCD-8 Road C-6

Off-Peak

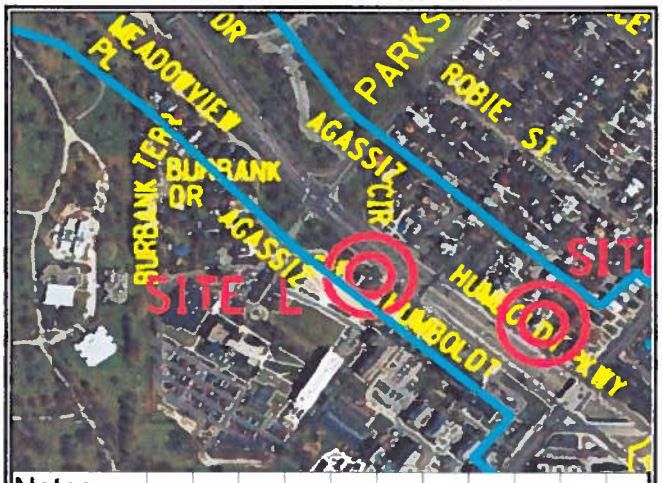
Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 12/08/2011 PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22 PERSONNEL: PGP, MPG, GM

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* 114.2 dBA *After:* 113.5 dBA

WIND: CALM DIRECTION: ____
TEMPERATURE: 35° F
HUMIDITY: 57%

LOCATION DIAGRAM



Notes:

RECEPTOR I.D. L

RUN TIME	NOISE LEVEL dBA	COMMENTS

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	67.5	67.1	66.9	67.4	67.2
Start Time 9:56	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

MPG - DI-0363 - COUNT 9 198 WB
GM - DI-0362 - COUNT 3 198 EB
PGP DI-0364 - COUNT 1

Peak

Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 3/06/2012 PROJECT NAME: Rt. 198, Scajaquada Expressway

LOCATION: Buffalo, New York

JOB NO: Y6197

PIN NO: 5470.22 PERSONNEL: MPG, RS, PGP

INSTRUMENT: CASELLA CEL-633C

S/N: 2911023

WEIGHTING: A

CALIBRATION: *Before:* 112.6 dBA *After:* 115.4 dBA

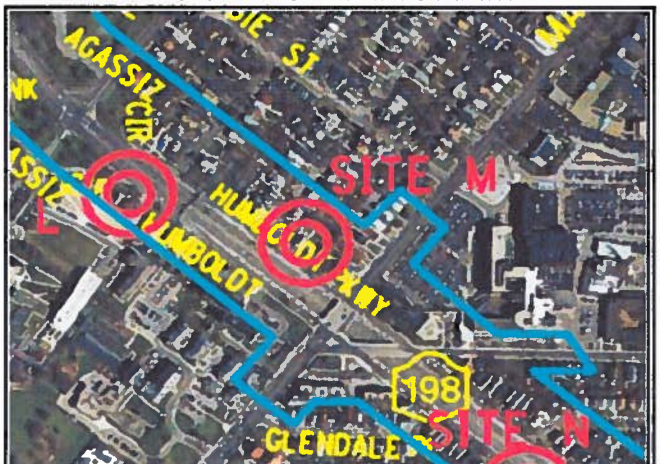
WIND: CALM DIRECTION:

TEMPERATURE: 20° F

HUMIDITY: 85%

RUN TIME	NOISE LEVEL dBA	COMMENTS

LOCATION DIAGRAM



Notes:

RECEPTOR I.D. M

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	67.7	67.6	68.2	68.3	
Start Time 7:18	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

MPG - D1-0363 C-11 WB

RS - D1-0364 C-10 EB

PGP - D1-0362 C-2 HUM

Off-Peak

Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 2/9/2012 PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York

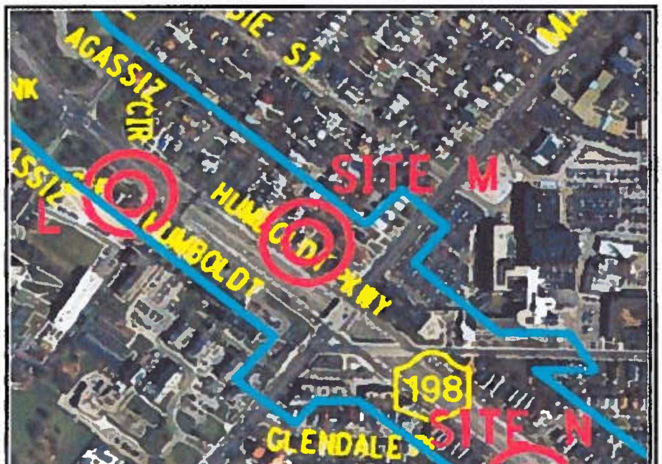
JOB NO: Y6197
PIN NO: 5470.22 PERSONNEL: RS, GM, PGP

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* 114.0 dBA *After:* 113.9 dBA

WIND: 8 MPH DIRECTION: WSW
TEMPERATURE: 30°F
HUMIDITY: 69%

RUN TIME	NOISE LEVEL dBA	COMMENTS

LOCATION DIAGRAM



Notes:

RECEPTOR I.D. M

RUN 14

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	67.8	67.1	66.9	66.7	
Start Time 9:08	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

RS - 62 C-12 GM - 64 C-14 PGP
WB EB

Peak

Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 2/9/2012
PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22
PERSONNEL: RS, GM, PGP

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* 114.4 dBA *After:* 114.0 dBA

WIND: 8 MPH DIRECTION: W
TEMPERATURE: 30°F
HUMIDITY: 72 %

RUN TIME	NOISE LEVEL dBA	COMMENTS

LOCATION DIAGRAM

Notes:

RECEPTOR I.D. N

RUN 13

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	71.3	71.4	71.5	71.5	71.6
Start Time	Minimum Recording Time			Extended Time	
8:21	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				
Requirements					

GM - 64 EB
C-13/

RS - 62 WB
C-11/

Off-Peak

Watts Architecture & Engineering, P.C.
NOISE SURVEY

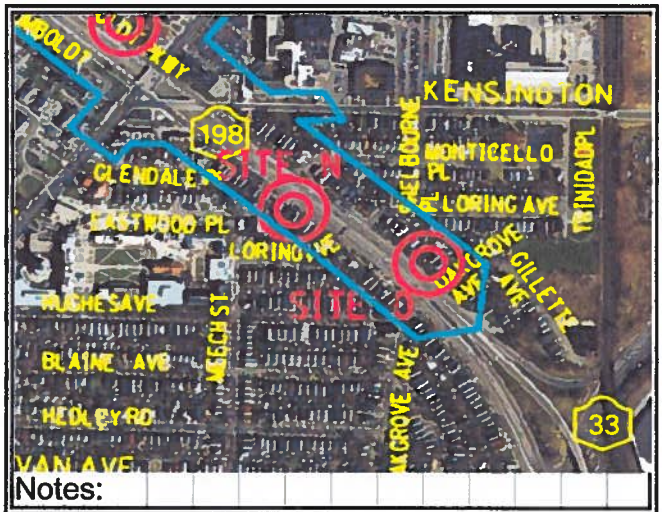
DATE: 12/08/2011 PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22 PERSONNEL: PGP, MPG, GM

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* 113.5 dBA *After:* 113.4 dBA

WIND: 6 MPH DIRECTION: W
TEMPERATURE: 37° F
HUMIDITY: 57%

RUN TIME	NOISE LEVEL dBA	COMMENTS
7:10	96.	SIREN

LOCATION DIAGRAM



Notes:

RECEPTOR I.D.	N

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	70.5	74.5	73.3	72.8	
Start Time 10:48	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

MG - 63 ⇒ 10 198 WB
GM - 62 ⇒ 4 198 EB
PGP - 64 ⇒ 2 HUMBOLT

Peak

Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 3/2/2012 PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York

JOB NO: Y6197
PIN NO: 5470.22 PERSONNEL: MM, GM, PGP

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* 113.3 dBA *After:* 114.6 dBA

WIND: CALM DIRECTION:
TEMPERATURE: 36° F
HUMIDITY: 89%

RUN TIME	NOISE LEVEL dBA	COMMENTS

LOCATION DIAGRAM

Notes:

RECEPTOR I.D. O

RUN 26

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	69.7	69.5	69.4	69.5	69.8
Start Time 7:39	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

GM- D1-0364 C-7 EB

MM D1-0362 C-1 WB

PGP T-1958 C-1 HUM

198 Field Survey Sheets v01.xlsx

Off-Peak

Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 2/3/2012 PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22 PERSONNEL:

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* 113.6 dBA *After:* 114.3 dBA

WIND: CALM DIRECTION:
TEMPERATURE: 34° F
HUMIDITY: 73%

LOCATION DIAGRAM

Notes:

RECEPTOR I.D. O

RUN TIME	NOISE LEVEL dBA	COMMENTS

Run 7

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	69.0	68.8	68.6	68.6	
Start Time 9:28	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

GM - 64 C-7 WB
RS - 62 C-5 EB
PGP - 63 C-1 Humb

Peak

Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 3/06/2012
PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22
PERSONNEL: MPG, RS, PGP

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* 115.4 dBA *After:* 114.0 dBA

WIND: CALM
DIRECTION:
TEMPERATURE: 23° F
HUMIDITY: 78 %

RUN TIME	NOISE LEVEL dBA	COMMENTS
4:50		PEOPLE TALKING
5:01		PEOPLE TALKING
7:00		SEMI - TRUCK
		DRIVE ASKING
		DIRECTIONS

LOCATION DIAGRAM

Notes:

RECEPTOR I.D. P1

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	62.3	67.3	68.7	67.7	
Start Time 7:58	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

MPG - DI-0363 C-12 MILITARY
RS - DI-0364 C-11 AUSTIN
PGP - DI-0362 C-3 JOSLYN

Off-Peak

Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 12/07/2011
PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22
PERSONNEL: PGP, MG

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* 114.2 dBA *After:* 113.8 dBA

WIND: CALM
DIRECTION:
TEMPERATURE: 34° F
HUMIDITY: 75 %

LOCATION DIAGRAM

Notes:

RECEPTOR I.D. P1

RUN TIME	NOISE LEVEL dBA	COMMENTS
		SCHOOL BUSES

RUN 28

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	66.4	67.0	66.1	65.2	
Start Time 14:30	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

MG - D1 - 0363 COUNT 5
MILITARY

PGP - D1 - 062 COUNT 2
AUSTIN ST.

Peak

Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 3/02/2012
PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22
PERSONNEL: GM, PGP

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* 114.6 dBA *After:* 114.0 dBA

WIND: CALM
DIRECTION:
TEMPERATURE: 36° F
HUMIDITY: 89%

LOCATION DIAGRAM

Notes:

RECEPTOR I.D. P2

RUN TIME	NOISE LEVEL dBA	COMMENTS

RUN 27

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	59.0	57.9	57.8		
Start Time 8:30	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

GM - DI-0364
AMHERST C-8

Off-Peak

Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 3/02/2012
PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22
PERSONNEL: GM, PGP

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* 114.0 dBA *After:* 114.1 dBA

WIND: CALM DIRECTION:
TEMPERATURE: 39° F
HUMIDITY: 79 %

LOCATION DIAGRAM

Notes:

RECEPTOR I.D. P2

RUN TIME	NOISE LEVEL dBA	COMMENTS

RUN 28

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	56.7	56.6	57.0	56.9	
Start Time 9:05	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

GM-01-0364
C-9

Peak

Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 2/2/2012 PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22 PERSONNEL: RS, PGP

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* 114.0 dBA *After:* 115.0 dBA

WIND: CALM DIRECTION:
TEMPERATURE: 31°F
HUMIDITY: 77°

LOCATION DIAGRAM

Notes:

RECEPTOR I.D. P3

RUN TIME	NOISE LEVEL dBA	COMMENTS
12:00	60.5	B, RD

RUN 1

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	52.3	52.4	53.2	52.9	52.6
Start Time 7:18	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

RS D1-0364 C.1 - MIDDLESEX

Off-Peak

Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 12/1/2011 PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22 PERSONNEL: PGP, MG

INSTRUMENT: Casella Cel-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* ____ dBA *After:* ____ dBA

WIND: 8 MPH DIRECTION: W
TEMPERATURE: 41 °F
HUMIDITY: 62%

RUN TIME	NOISE LEVEL dBA	COMMENTS

LOCATION DIAGRAM

Notes:

RECEPTOR I.D. P3

Run 20

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	52.5	52.9	53.4	53.4	
Start Time 16:15	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

MG - DI-0343 - Elmwood Count 10 DI-0362 - PGP - Middlesex Count 8

Peak

Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 2/2/2012 PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York

JOB NO: Y6197

PIN NO: 5470.22 PERSONNEL: RS, PGP

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* 115.0 dBA *After:* 114.2 dBA

WIND: CALM DIRECTION:
TEMPERATURE: 32° F
HUMIDITY: 76°

RUN TIME	NOISE LEVEL dBA	COMMENTS

LOCATION DIAGRAM

Notes:

RECEPTOR I.D. P4

RUN 2

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	56.1	55.3	54.6	53.9	
Start Time 7:58	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

RS D1-0364 C.2 - MIDDLESEX

Off-Peak

Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 12/1/2011 PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22 PERSONNEL: PGP, MG

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* ____ dBA *After:* ____ dBA

WIND: 8 MPH DIRECTION: W
TEMPERATURE: 41° F
HUMIDITY: 62 %

LOCATION DIAGRAM

Notes:

RECEPTOR I.D. P4

RUN TIME	NOISE LEVEL dBA	COMMENTS
7:29	61.5	Dog

RUN 019

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	56.7	56.8	56.2	55.6	55.5
Start Time 15:37	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

MG - MIDDLESEX - DI-0363
COUNT 9

Peak

Watts Architecture & Engineering, P.C.
NOISE SURVEY

DATE: 2/2/2012 PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22 PERSONNEL: RS, GM, PGP

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* 114.2 dBA *After:* 114.2 dBA

WIND: CALM DIRECTION:
TEMPERATURE: 32° F
HUMIDITY: 76°

LOCATION DIAGRAM

Notes:

RECEPTOR I.D. P5

RUN TIME	NOISE LEVEL dBA	COMMENTS

RUN 3

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	57.6	57.3	57.3		
Start Time 8:45	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

RS - D1-0364 - LINLC C 3

GM - D1-0362 - FOREST C-1

Off-Peak

Watts Architecture & Engineering, P.C.
NOISE SURVEY

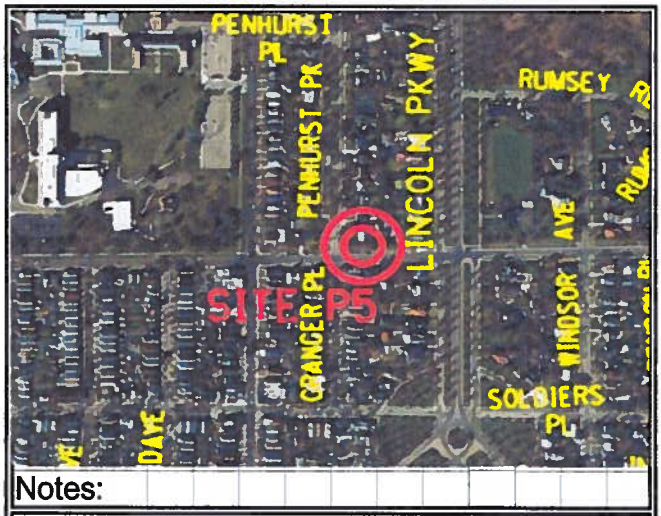
DATE: 12/07/2011
PROJECT NAME: Rt. 198, Scajaquada Expressway
LOCATION: Buffalo, New York
JOB NO: Y6197
PIN NO: 5470.22
PERSONNEL: PGP, MPG

INSTRUMENT: CASELLA CEL-633C
S/N: 2911023
WEIGHTING: A
CALIBRATION: *Before:* 113.7 dBA *After:* 114.2 dBA

WIND: 4 MPH DIRECTION: NW
TEMPERATURE: 35° F
HUMIDITY: 70%

RUN TIME	NOISE LEVEL dBA	COMMENTS
16:00	65	SIREN
20:40	65	SIREN
22:00	61	SIREN

LOCATION DIAGRAM



Notes:

RECEPTOR I.D. P5

RUN 27

Time Interval	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.
LEQ Reading	54.6	55.4	55.9	56.9	56.8
Start Time 13:30	Minimum Recording Time			Extended Time	
Requirements	Continue recording LEQ levels at 5 minute intervals, up to 25 minutes, or until two consecutive recordings are the same during the minimum 15 minutes.				

MG - DI-0363 COUNT 4
LINCOLN PKWY

PGP - DI-0362 COUNT 1
FOREST AVE

ATTACHMENT C

TNM Model Output

Bergmann Associates 16-Jul-16
BJD TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: PIN 5470.22/Route 198, Scajaquada
RUN: 2016 Existing - Peak AM
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 20 deg C, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	**Existing (2016)** LAeq1h Calculated	Crit'n	**No Build (2040)** LAeq1h Calculated	Crit'n	**Build (2040)** LAeq1h Calculated	Crit'n
	dBA	dBA	dBA	dBA	dBA	dBA
Receiver A	57	66	57.3	66	56.5	66
Receiver B	59.7	66	60	66	59.4	66
Receiver C	57.9	66	58.2	66	58.3	66
Receiver D	61.3	66	61.5	66	61.1	66
Receiver E	60.8	66	61	66	60.4	66
Receiver F	60.8	66	61	66	60.5	66
Receiver G	65.8	66	66.1	66	65.8	66
Receiver H	67.9	66	68.1	66	67.9	66
Receiver I	59.1	66	59.6	66	59.6	66
Receiver J	63.5	66	63.8	66	63.5	66
Receiver K	63.3	66	63.6	66	63.3	66
Receiver L	71	66	71.3	66	71.1	66
Receiver M	67.1	66	67.4	66	67.1	66
Receiver N	69.5	66	69.7	66	69.7	66
Receiver O	67	66	67.2	66	67.4	66
Receiver P1	64.9	66	64.9	66	64.9	66
Receiver P2	59.6	66	59.6	66	59.6	66
Receiver P3	50.9	66	51.2	66	51	66
Receiver P4	53.3	66	53.5	66	53.4	66
Receiver P5	58.7	66	58.7	66	58.7	66

Bergmann Associates 16-Jul-16
BJD TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: PIN 5470.22/Route 198, Scajaqua
RUN: 2040 Build 2B - 5% Diversion - Pe

ATMOSPHERICS: 20 deg C, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

BARRIER DESIGN: Barrier G

Receiver Name	#DUs	No Barrier LAeq1h Calculated dBA	Crit'n dBA	Type Impact	With Barrier LAeq1h dBA	Noise Reduction Calculated dB	Goal dB	Calculated minus Goal dB
Receiver G (Equiv.)	2	66.1	66	Snd Lvl	60.3	5.8	8	-2.2

Dwelling Units (Equiv.)	# DUs	Noise Reduction Avg dB	Max dB
All Selected	2	5.8	5.8
All Impacted	2	5.8	5.8
All that meet NR Goal	0	0	0

BARRIER DESIGN: Barrier H

Receiver Name	#DUs	No Barrier LAeq1h Calculated dBA	Crit'n dBA	Type Impact	With Barrier LAeq1h dBA	Noise Reduction Calculated dB	Goal dB	Calculated minus Goal dB
Receiver H1 (Equiv.)	4	68	66	Snd Lvl	58.9	9.1	8	1.1
Receiver H2	6	59.6	66	----	58.6	1	8	-7
Receiver H3	4	61.3	66	----	58.1	3.2	8	-4.8
Receiver H4	1	60.3	66	----	57.4	2.9	8	-5.1

Dwelling Units	# DUs	Avg dB	Max dB
All Selected	15	4	9.1
All Impacted	4	9.1	9.1
All that meet NR Goal	4	9.1	9.1

Bergmann Associates 16-Jul-16
BJD TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: PIN 5470.22/Route 198, Scajaqua
RUN: 2040 Build 2B - 5% Diversion - Pe

ATMOSPHERICS: 20 deg C, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

BARRIER DESIGN: Barrier L

Receiver Name	#DUs	No Barrier LAeq1h Calculated dBA	Crit'n dBA	Type Impact	With Barrier Calculated LAeq1h dBA	Noise Reduction Calculated dB	Goal dB	Calculated minus Goal dB
L1	3	69	66	Snd Lvl	60	9	8	1
L2	2	70.8	66	Snd Lvl	61.6	9.2	8	1.2
L3	2	70.6	66	Snd Lvl	62.5	8.1	8	0.1
L4	4	70.5	66	Snd Lvl	65.4	5.1	8	-2.9
L5	1	70.5	66	Snd Lvl	69.8	0.7	8	-7.3
L_APT BLD 2_1	2	65.2	66	----	63.4	1.8	8	-6.2
L_APT BLD 2_2	3	65.3	66	----	62.1	3.2	8	-4.8
L_APT BLD 2_3	3	68	66	Snd Lvl	63.2	4.8	8	-3.2
L_APT BLD 2_4	3	69	66	Snd Lvl	65.9	3.1	8	-4.9
L_APT BLD 3_1	2	66.9	66	Snd Lvl	64.3	2.6	8	-5.4
L_APT BLD 3_2	3	67.3	66	Snd Lvl	63.1	4.2	8	-3.8
L_APT BLD 3_3	3	69.6	66	Snd Lvl	64.2	5.4	8	-2.6
L_APT BLD 3_4	3	70.3	66	Snd Lvl	66.3	4	8	-4

Dwelling Units	# DUs	Avg dB	Max dB
All Selected	34	4.7	9.2
All Impacted	29	5.1	9.2
All that meet NR Goal	7	8.8	9.2

BARRIER DESIGN: Barrier M

Receiver Name	#DUs	No Barrier LAeq1h Calculated dBA	Crit'n dBA	Type Impact	With Barrier Calculated LAeq1h dBA	Noise Reduction Calculated dB	Goal dB	Calculated minus Goal dB
M1	1	68.8	66	Snd Lvl	59.9	8.9	8	0.9
M2	4	70.8	66	Snd Lvl	61.2	9.6	8	1.6
M3	3	69.5	66	Both	63.8	5.7	8	-2.3
M4	7	69.3	66	Both	69	0.3	8	-7.7
M5	3	66.2	66	Both	65.1	1.1	8	-6.9
M6	2	66.1	66	Snd Lvl	64.9	1.2	8	-6.8
M7	2	65.6	66	----	64.6	1	8	-7
M8	1	66.4	66	Snd Lvl	65.7	0.7	8	-7.3

Dwelling Units	# DUs	Avg dB	Max dB
All Selected	23	3.3	9.6
All Impacted	23	3.6	9.6
All that meet NR Goal	5	9.3	9.6

Bergmann Associates 16-Jul-16
BJD TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: PIN 5470.22/Route 198, Scajaqua
RUN: 2040 Build 2B - 5% Diversion - Pe

Average pavement type shall be used unless
ATMOSPHERICS: 20 deg C, 50% RH a State highway agency substantiates the use
of a different type with approval of FHWA.

BARRIER DESIGN: Barrier N

Receiver Name	#DUs	No Barrier LAeq1h Calculated dBA	Crit'n dBA	Type Impact	With Barrier Calculated LAeq1h dBA	Noise Reduction Calculated dB	Goal dB	Calculated minus Goal dB
N1	12	67.4	66	Snd Lvl	66.2	1.2	8	-6.8
N2	4	68.1	66	Snd Lvl	66.7	1.4	8	-6.6
N3	5	68.8	66	Snd Lvl	67.6	1.2	8	-6.8
N4	4	70.7	66	Snd Lvl	70.2	0.5	8	-7.5
N5	5	71.5	66	Snd Lvl	70.8	0.7	8	-7.3
N6	2	72.1	66	Snd Lvl	65.1	7	8	-1
N7	4	68.3	66	Snd Lvl	61.3	7	8	-1
N8	3	67.5	66	Snd Lvl	59.2	8.3	8	0.3
N9	1	68.9	66	Snd Lvl	60.9	8	8	0
N10	4	66.9	66	Snd Lvl	58.6	8.3	8	0.3
N11	4	68.1	66	Snd Lvl	59.9	8.2	8	0.2
N12	7	67.9	66	Snd Lvl	59.8	8.1	8	0.1
N13	2	68.6	66	Snd Lvl	62.6	6	8	-2
	57							

Dwelling Units	# DUs	Avg dB	Max dB
All Selected	57	4.9	8.3
All Impacted	57	4.9	8.3
All that meet NR Goal	19	8.2	8.3

BARRIER DESIGN: Barrier O

Receiver Name	#DUs	No Barrier LAeq1h Calculated dBA	Crit'n dBA	Type Impact	With Barrier Calculated LAeq1h dBA	Noise Reduction Calculated dB	Goal dB	Calculated minus Goal dB
O1	4	68.8	66	Snd Lvl	66.5	2.3	8	-5.7
O2	1	68.1	66	Snd Lvl	65.8	2.3	8	-5.7
O3	4	68	66	Snd Lvl	65.3	2.7	8	-5.3
O4	4	68.7	66	Snd Lvl	65.5	3.2	8	-4.8
O5	2	70.2	66	Snd Lvl	66.2	4	8	-4
O6	1	70.6	66	Snd Lvl	67.7	2.9	8	-5.1
O7	9	70.3	66	Snd Lvl	70.3	0	8	-8
O8	3	69.3	66	Snd Lvl	66.5	2.8	8	-5.2
O9	3	67.2	66	Snd Lvl	61.5	5.7	8	-2.3
O10	4	66.8	66	Snd Lvl	58.6	8.2	8	0.2
O11	3	66.7	66	Snd Lvl	59.1	7.6	8	-0.4
O12	3	64.4	66	----	63.5	0.9	8	-7.1
	41							

Dwelling Units	# DUs	Avg dB	Max dB
All Selected	41	3.9	8.3
All Impacted	38	4.2	8.3
All that meet NR Goal	5	8.3	8.3